

**ANNEX I**

**SUMMARY OF PRODUCT CHARACTERISTICS**

## **1. NAME OF THE MEDICINAL PRODUCT**

Briviact 10 mg film-coated tablets  
Briviact 25 mg film-coated tablets  
Briviact 50 mg film-coated tablets  
Briviact 75 mg film-coated tablets  
Briviact 100 mg film-coated tablets

## **2. QUALITATIVE AND QUANTITATIVE COMPOSITION**

### Briviact 10 mg film-coated tablets

Each film-coated tablet contains 10 mg brivaracetam.

### Briviact 25 mg film-coated tablets

Each film-coated tablet contains 25 mg brivaracetam.

### Briviact 50 mg film-coated tablets

Each film-coated tablet contains 50 mg brivaracetam.

### Briviact 75 mg film-coated tablets

Each film-coated tablet contains 75 mg brivaracetam.

### Briviact 100 mg film-coated tablets

Each film-coated tablet contains 100 mg brivaracetam.

### Excipient(s) with known effect:

#### Briviact 10 mg film-coated tablets

Each 10 mg film-coated tablet contains 88 mg lactose.

#### Briviact 25 mg film-coated tablets

Each 25 mg film-coated tablet contains 94 mg lactose.

#### Briviact 50 mg film-coated tablets

Each 50 mg film-coated tablet contains 189 mg lactose.

#### Briviact 75 mg film-coated tablets

Each 75 mg film-coated tablet contains 283 mg lactose.

#### Briviact 100 mg film-coated tablets

Each 100 mg film-coated tablet contains 377 mg lactose.

For the full list of excipients, see section 6.1.

### **3. PHARMACEUTICAL FORM**

Film-coated tablet (tablet)

#### Briviact 10 mg film-coated tablets

White to off-white, round film-coated tablets of 6.5 mm in diameter and debossed with 'u10' on one side.

#### Briviact 25 mg film-coated tablets

Grey, oval film-coated tablets with dimensions of 8.9 mm x 5.0 mm and debossed with 'u25' on one side.

#### Briviact 50 mg film-coated tablets

Yellow, oval film-coated tablets with dimensions of 11.7 mm x 6.6 mm and debossed with 'u50' on one side.

#### Briviact 75 mg film-coated tablets

Purple, oval film-coated tablets with dimensions of 13.0 mm x 7.3 mm debossed with 'u75' on one side.

#### Briviact 100 mg film-coated tablets

Green-grey, oval film-coated tablets with dimensions of 14.5 mm x 8.1 mm and debossed with 'u100' on one side.

### **4. CLINICAL PARTICULARS**

#### **4.1 Therapeutic indications**

Briviact is indicated as adjunctive therapy in the treatment of partial onset seizures with or without secondary generalisation in adults, adolescents and children from 2 years of age with epilepsy.

#### **4.2 Posology and method of administration**

##### Posology

The physician should prescribe the most appropriate formulation and strength according to weight and dose.

The recommended posology for adults, adolescents and children from 2 years of age is summarised in the following table. The dose should be administered in two equally divided doses, approximately 12 hours apart.

Recommended starting dose	Recommended maintenance dose	Therapeutic dose range*
<b>Adolescents and children weighing 50 kg or more, and adults</b>		
50 mg/day (or 100 mg/day)**	100 mg/day	50 - 200 mg/day
<b>Adolescents and children weighing from 20 kg to less than 50 kg</b>		
1 mg/kg/day (up to 2 mg/kg/day)**	2 mg/kg/day	1 – 4 mg/kg/day
<b>Children weighing from 10 kg to less than 20 kg</b>		
1 mg/kg/day (up to 2.5 mg/kg/day)**	2.5 mg/kg/day	1 – 5 mg/kg/day

\* Based on individual patient response, the dose may be adjusted within this effective dose range.

\*\* Based on physician's assessment of need for seizure control

#### *Adults*

The recommended starting dose is either 50 mg/day or 100 mg/day based on physician's assessment of required seizure reduction versus potential side effects. Based on individual patient response and tolerability, the dose may be adjusted in the effective dose range of 50 mg/day to 200 mg/day.

#### *Adolescents and children weighing 50 kg or more*

The recommended starting dose is 50 mg/day. Brivaracetam may also be initiated at 100 mg/day based on physician's assessment of need for seizure control. The recommended maintenance dose is 100 mg/day. Based on individual patient response, the dose may be adjusted in the effective dose range of 50 mg/day to 200 mg/day.

#### *Adolescents and children weighing from 20 kg to less than 50 kg*

The recommended starting dose is 1 mg/kg/day. Brivaracetam may also be initiated at doses up to 2 mg/kg/day based on physician's assessment of need for seizure control. The recommended maintenance dose is 2 mg/kg/day. Based on individual patient response, the dose may be adjusted in the effective dose range of 1 mg/kg/day to 4 mg/kg/day.

#### *Children weighing from 10 kg to less than 20 kg*

The recommended starting dose is 1 mg/kg/day. Brivaracetam may also be initiated at doses up to 2.5 mg/kg/day based on physician's assessment of need for seizure control. The recommended maintenance dose is 2.5 mg/kg/day. Based on individual patient response, the dose may be adjusted in the effective dose range of 1 mg/kg/day to 5 mg/kg/day.

#### *Missed doses*

If patients missed one dose or more, it is recommended that they take a single dose as soon as they remember and take the following dose at the usual morning or evening time. This may avoid the brivaracetam plasma concentration falling below the efficacy level and prevent breakthrough seizures from occurring.

#### *Discontinuation*

For patients from 16 years of age, if brivaracetam has to be discontinued, it is recommended that the dose is reduced gradually by 50 mg/day on a weekly basis.

For patients below the age of 16 years, if brivaracetam has to be discontinued, it is recommended that the dose is reduced by a maximum of half the dose every week until a dose of 1 mg/kg/day (for patients with a body weight less than 50 kg) or 50 mg/day (for patients with body weight of 50 kg or more) is reached.

After 1 week of treatment at 50 mg/day, a final week of treatment at the dose of 20 mg/day is recommended.

## Special populations

### *Elderly (65 years of age and above)*

No dose adjustment is needed in elderly patients (see section 5.2).

The clinical experience in patients  $\geq 65$  years is limited.

### *Renal impairment*

No dose adjustment is needed in patients with impaired renal function (see section 5.2). Brivaracetam is not recommended in end-stage renal disease patients undergoing dialysis due to lack of data.

Based on data in adults, no dose adjustment is necessary in paediatric patients with impaired renal function. No clinical data are available in paediatric patients with renal impairment.

### *Hepatic impairment*

Exposure to brivaracetam was increased in adult patients with chronic liver disease.

In patients with hepatic impairment, the following adjusted doses, administered in 2 divided doses, approximately 12 hours apart, are recommended for all stages of hepatic impairment (see sections 4.4 and 5.2). No clinical data are available in paediatric patients with hepatic impairment.

Age and body weight	Recommended starting dose	Recommended maximum daily dose
Adolescents and children weighing 50 kg or more, and adults	50 mg/day	150 mg/day
Adolescents and children weighing from 20 kg to less than 50 kg	1 mg/kg/day	3 mg/kg/day
Children weighing from 10 kg to less than 20 kg	1 mg/kg/day	4 mg/kg/day

### *Paediatric patients less than 2 years of age*

The efficacy of brivaracetam in paediatric patients aged less than 2 years has not yet been established. Currently available data are described in section 4.8, 5.1, and 5.2 but no recommendation on a posology can be made.

## Method of administration

Brivaracetam film-coated tablets must be taken orally and swallowed in whole with liquid and may be taken with or without food (see section 5.2). Patients not being able to swallow tablets in whole or patients for whom the dose can not be met with the use of whole tablets should use Briviact 10 mg/ml oral solution.

## **4.3 Contraindications**

Hypersensitivity to the active substance or other pyrrolidone derivatives or to any of the excipients listed in section 6.1.

## **4.4 Special warnings and precautions for use**

### Suicidal ideation and behaviour

Suicidal ideation and behaviour have been reported in patients treated with anti-epileptic drugs (AEDs), including brivaracetam, in several indications. A meta-analysis of randomized placebo-controlled clinical studies of AEDs has also shown a small increased risk of suicidal ideation and behaviour. The mechanism of this risk is not known and the available data do not exclude the possibility of an increased risk for brivaracetam.

Patients should be monitored for signs of suicidal ideation and behaviours and appropriate treatment should be considered. Patients (and caregivers of patients) should be advised to seek medical advice should any signs of suicidal ideation or behaviour emerge. See also section 4.8, paediatric data.

## Hepatic impairment

There are limited clinical data on the use of brivaracetam in patients with pre-existing hepatic impairment. Dose adjustments are recommended for patients with hepatic impairment (see section 4.2).

## Severe cutaneous adverse reactions (SCARs)

Severe cutaneous adverse reactions (SCARs) including Stevens-Johnson syndrome (SJS), which can be life-threatening or fatal, have been reported in association with brivaracetam treatment. At the time of the prescription patients should be advised of the signs and symptoms and monitored closely for skin reactions. If signs and symptoms suggestive of these reactions appear, brivaracetam should be withdrawn immediately and an alternative treatment should be considered.

## Excipients

### *Lactose intolerance*

Brivaracetam film-coated tablets contain lactose. Patients with rare hereditary problems of galactose intolerance, total lactase deficiency or glucose-galactose malabsorption should not take this medicine.

### *Sodium content*

Brivaracetam film-coated tablets contain less than 1 mmol sodium (23mg) per tablet, that is to say essentially 'sodium free'.

## **4.5 Interaction with other medicinal products and other forms of interaction**

Formal interaction studies have only been performed in adults.

### Pharmacodynamic interactions

#### *Concomitant treatment with levetiracetam*

In the clinical studies, although the numbers were limited, there was no observed benefit of brivaracetam versus placebo in patients taking levetiracetam concurrently. No additional safety or tolerability concern was observed (see section 5.1).

#### *Interaction with alcohol*

In a pharmacokinetic and pharmacodynamic interaction study between brivaracetam 200 mg single dose and ethanol 0.6 g/L continuous infusion in healthy subjects, there was no pharmacokinetic interaction, but brivaracetam approximately doubled the effect of alcohol on psychomotor function, attention and memory. Intake of brivaracetam with alcohol is not recommended.

### Pharmacokinetic interactions

#### *Effects of other medicinal products on the pharmacokinetics of brivaracetam*

*In vitro* data suggest that brivaracetam has a low interaction potential. The main disposition pathway of brivaracetam is by CYP-independent hydrolysis. A second disposition pathway involves hydroxylation mediated by CYP2C19 (see section 5.2).

Brivaracetam plasma concentrations may increase when coadministered with CYP2C19 strong inhibitors (e.g. fluconazole, fluvoxamine), but the risk of a clinically relevant CYP2C19-mediated interaction is considered to be low. Limited clinical data are available implying that coadministration of cannabidiol may increase the plasma exposure of brivaracetam, possibly through CYP2C19 inhibition, but the clinical relevance is uncertain.

### *Rifampicin*

In healthy subjects, coadministration with the strong enzyme inducer rifampicin (600 mg/day for 5 days), decreased brivaracetam area under the plasma concentration curve (AUC) by 45 %. Prescribers should consider adjusting the brivaracetam dose in patients starting or ending treatment with rifampicin.

### *Strong enzyme inducing AEDs*

Brivaracetam plasma concentrations are decreased when coadministered with strong enzyme inducing AEDs (carbamazepine, phenobarbital, phenytoin) but no dose adjustment is required (see table 1).

### *Other enzyme inducers*

Other strong enzyme inducers (such as St John's wort (*Hypericum perforatum*)) may also decrease the systemic exposure of brivaracetam. Therefore, starting or ending treatment with St John's wort should be done with caution.

### *Effects of brivaracetam on other medicinal products*

Brivaracetam given 50 or 150 mg/day did not affect the AUC of midazolam (metabolised by CYP3A4). The risk of clinically relevant CYP3A4 interactions is considered to be low.

*In vitro* studies have shown that brivaracetam exhibits little or no inhibition of CYP450 isoforms except for CYP2C19. Brivaracetam may increase plasma concentrations of medicinal products metabolised by CYP2C19 (e.g. lansoprazole, omeprazole, diazepam). When tested *in vitro* brivaracetam did not induce CYP1A1/2 but induced CYP3A4 and CYP2B6. No CYP3A4 induction was found *in vivo* (see midazolam above). CYP2B6 induction has not been investigated *in vivo* and brivaracetam may decrease plasma concentrations of medicinal products metabolised by CYP2B6 (e.g. efavirenz). *In vitro* interaction studies to determine the potential inhibitory effects on transporters concluded that there were no clinically relevant effects, except for OAT3. *In vitro*, Brivaracetam inhibits OAT3 with a half maximal inhibitory concentration 42-fold higher than the  $C_{max}$  at the highest clinical dose. Brivaracetam 200mg/day may increase plasma concentrations of medicinal products transported by OAT3.

### Antiepileptic drugs

Potential interactions between brivaracetam (50 mg/day to 200 mg/day) and other AEDs were investigated in a pooled analysis of plasma drug concentrations from all phase 2-3 studies, in a population pharmacokinetic analysis of placebo-controlled phase 2-3 clinical studies, and in dedicated drug-drug interaction studies (for the following AEDs: carbamazepine, lamotrigine, phenytoin and topiramate). The effect of the interactions on the plasma concentration is summarised in table 1 (increase is indicated as “↑” and decrease as “↓”, area under the plasma concentration versus time curve as “AUC”, maximum observed concentration as  $C_{max}$ ).

Table 1: Pharmacokinetic interactions between brivaracetam and other AEDs

AED coadministered	Influence of AED on brivaracetam plasma concentration	Influence of brivaracetam on AED plasma concentration
Carbamazepine	AUC 29 % ↓ C <sub>max</sub> 13 % ↓ No dose adjustment required	Carbamazepine - None Carbamazepine-epoxide ↑ (See below) No dose adjustment required.
Clobazam	No data available	None
Clonazepam	No data available	None
Lacosamide	No data available	None
Lamotrigine	None	None
Levetiracetam	None	None
Oxcarbazepine	None	None (monohydroxy derivative, MHD)
Phenobarbital	AUC 19 % ↓ No dose adjustment required	None
Phenytoin	AUC 21 % ↓ No dose adjustment required	None <sup>a</sup> AUC 20% ↑ <sup>a</sup> C <sub>max</sub> 20% ↑
Pregabalin	No data available	None
Topiramate	None	None
Valproic acid	None	None
Zonisamide	No data available	None

<sup>a</sup> based on a study involving the administration of a supratherapeutic dose of 400 mg/day brivaracetam.

#### *Carbamazepine*

Brivaracetam is a moderate reversible inhibitor of epoxide hydrolase resulting in an increased concentration of carbamazepine epoxide, an active metabolite of carbamazepine. In controlled clinical studies, the carbamazepine epoxide plasma concentration increased by a mean of 37 %, 62 % and 98 % with little variability at brivaracetam doses of 50 mg/day, 100 mg/day and 200 mg/day respectively. No safety risks were observed. There was no additive effect of brivaracetam and valproate on the AUC of carbamazepine epoxide.

#### Oral contraceptives

Co-administration of brivaracetam (100 mg/day) with an oral contraceptive containing ethinylestradiol (0.03 mg) and levonorgestrel (0.15 mg) did not influence the pharmacokinetics of either substance. When brivaracetam was coadministered at a dose of 400 mg/day (twice the recommended maximum daily dose) with an oral contraceptive containing ethinylestradiol (0.03 mg) and levonorgestrel (0.15 mg), a reduction in oestrogen and progestin AUCs of 27 % and 23 %, respectively, was observed without impact on suppression of ovulation. There was generally no change in the concentration-time profiles of the endogenous markers estradiol, progesterone, luteinizing hormone (LH), follicle stimulating hormone (FSH), and sex hormone binding globulin (SHBG).

## **4.6 Fertility, pregnancy and lactation**

### Women of childbearing potential

Physicians should discuss family planning and contraception with women of childbearing potential taking brivaracetam (see Pregnancy).

If a woman decides to become pregnant, the use of brivaracetam should be carefully re-evaluated.



## Pregnancy

### *Risk related to epilepsy and antiepileptic medicinal products in general*

For all anti-epileptic drugs, it has been shown that in the offspring of treated women with epilepsy, the prevalence of malformations is two to three times greater than the rate of approximately 3 % in the general population. In the treated population, an increase in malformations has been noted with polytherapy; however, the extent to which the treatment and/or the underlying condition is responsible has not been elucidated. Discontinuation of anti-epileptic treatments may result in exacerbation of the disease which could be harmful to the mother and the foetus.

### *Risk related to brivaracetam*

There is a limited amount of data from the use of brivaracetam in pregnant women. There is no data on placental transfer in humans, but brivaracetam was shown to readily cross the placenta in rats (see section 5.3). The potential risk for humans is unknown. Animal studies did not detect any teratogenic potential of brivaracetam (see section 5.3).

In clinical studies, brivaracetam was used as adjunctive therapy and when it was used with carbamazepine, it induced a dose-related increase in the concentration of the active metabolite, carbamazepine-epoxide (see section 4.5). There is insufficient data to determine the clinical significance of this effect in pregnancy.

As a precautionary measure, brivaracetam should not be used during pregnancy unless clinically necessary i.e. (if the benefit to the mother clearly outweighs the potential risk to the foetus).

## Breast-feeding

Brivaracetam is excreted in human breast milk. A decision should be made whether to discontinue breastfeeding or to discontinue brivaracetam, taking into account the benefit of the medicinal product to the mother. In case of co-administration of brivaracetam and carbamazepine, the amount of carbamazepine-epoxide excreted in breast milk could increase. There is insufficient data to determine the clinical significance.

## Fertility

No human data on the effect of brivaracetam on fertility are available. In rats, there was no effect on fertility with brivaracetam (see section 5.3).

## **4.7 Effects on ability to drive and use machines**

Brivaracetam has minor or moderate influence on the ability to drive and use machines.

Due to possible differences in individual sensitivity some patients might experience somnolence, dizziness, and other central nervous system (CNS) related symptoms. Patients should be advised not to drive a car or to operate other potentially hazardous machines until they are familiar with the effects of brivaracetam on their ability to perform such activities.

## **4.8 Undesirable effects**

### Summary of the safety profile

The most frequently reported adverse reactions (>10 %) with brivaracetam treatment were: somnolence (14.3 %) and dizziness (11.0 %). They were usually mild to moderate in intensity. Somnolence and fatigue were reported at a higher incidence with increasing dose.

The discontinuation rate due to adverse reactions was 3.5 %, 3.4 % and 4.0 % for patients randomized to brivaracetam at respectively the dose of 50 mg/day, 100 mg/day and 200 mg/day and 1.7 % for

patients randomized to placebo. The adverse reactions most frequently resulting in discontinuation of brivaracetam therapy were dizziness (0.8 %) and convulsion (0.8 %).

#### Tabulated list of adverse reactions

In the table below, adverse reactions, which were identified based on review of the three placebo-controlled, fixed-dose studies safety database in subjects  $\geq 16$  years of age and from post-marketing experience, are listed by System Organ Class and frequency.

The frequencies are defined as follows: very common ( $\geq 1/10$ ), common ( $\geq 1/100$  to  $< 1/10$ ), uncommon ( $\geq 1/1,000$  to  $< 1/100$ ) and not known (frequency cannot be estimated from available data). Within each frequency grouping, undesirable effects are presented in order of decreasing seriousness.

<b>System organ class</b>	<b>Frequency</b>	<b>Adverse reactions</b>
<b>Infections and infestations</b>	Common	Influenza
<b>Blood and lymphatic system disorders</b>	Uncommon	Neutropenia
<b>Immune system disorders</b>	Uncommon	Type I hypersensitivity
<b>Metabolism and nutrition disorders</b>	Common	Decreased appetite
<b>Psychiatric disorders</b>	Common	Depression, anxiety, insomnia, irritability
	Uncommon	Suicidal ideation, psychotic disorder, aggression, agitation
<b>Nervous system disorders</b>	Very common	Dizziness, somnolence
	Common	Convulsion, vertigo
<b>Respiratory, thoracic and mediastinal disorders</b>	Common	Upper respiratory tract infections, cough
<b>Gastrointestinal disorders</b>	Common	Nausea, vomiting, constipation
<b>Skin and subcutaneous tissue disorders</b>	Not known	Stevens-Johnson syndrome <sup>(1)</sup>
<b>General disorders and administration site conditions</b>	Common	Fatigue

<sup>(1)</sup> Adverse reactions reported in post marketing experience.

#### Description of selected adverse reactions

Neutropenia has been reported in 0.5 % (6/1099) brivaracetam patients and 0 % (0/459) placebo patients. Four of these subjects had decreased neutrophil counts at baseline, and experienced additional decrease in neutrophil counts after initiation of brivaracetam treatment. None of the 6 cases of neutropenia were severe, required any specific treatment or led to discontinuation of brivaracetam and none had associated infections.

Suicidal ideation has been reported in 0.3 % (3/1099) brivaracetam patients and 0.7 % (3/459) placebo patients. In the short-term clinical studies of brivaracetam in epilepsy patients, there were no cases of completed suicide and suicide attempt, however both have been reported in open-label extension studies (see section 4.4).

Reactions suggestive of immediate (Type I) hypersensitivity have been reported in a small number of brivaracetam patients (9/3022) during clinical development.

#### Paediatric population

The safety profile of brivaracetam observed in children from 1 month of age was consistent with the safety profile observed in adults. In the open label, uncontrolled, long-term studies suicidal ideation was reported in 4.7 % of paediatric patients assessed from 6 years onwards (more common in

adolescents) compared with 2.4 % of adults and behavioural disorders were reported in 24.8 % of paediatric patients compared with 15.1 % of adults. The majority of events were mild or moderate in intensity, were non-serious, and did not lead to discontinuation of study drug. An additional adverse reaction reported in children was psychomotor hyperactivity (4.7 %).

No specific pattern of adverse event (AE) was identified in children from 1<sup>st</sup> month to < 4<sup>th</sup> years of age when compared to older paediatric age groups. No significant safety information was identified indicating the increasing incidence of a particular AE in this age group. As data available in children younger than 2 years of age is limited, brivaracetam is not indicated in this age range. Limited clinical data are available in neonates.

### Elderly

Of the 130 elderly subjects enrolled in the brivaracetam phase 2/3 development program (44 with epilepsy), 100 were 65-74 years of age and 30 were 75-84 years of age. The safety profile in elderly patients appears to be similar to that observed in younger adult patients.

### 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**

### Symptoms

There is limited clinical experience with brivaracetam overdose in humans. Somnolence and dizziness have been reported in a healthy subject taking a single dose of 1,400 mg of brivaracetam. The following adverse reactions were reported with brivaracetam overdose: nausea, vertigo, balance disorder, anxiety, fatigue, irritability, aggression, insomnia, depression, and suicidal ideation in the post-marketing experience. In general, the adverse reactions associated with brivaracetam overdose were consistent with the known adverse reactions.

### Management of overdose

There is no specific antidote for overdose with brivaracetam. Treatment of an overdose should include general supportive measures. Since less than 10 % of brivaracetam is excreted in urine, haemodialysis is not expected to significantly enhance brivaracetam clearance (see section 5.2).

## **5. PHARMACOLOGICAL PROPERTIES**

### **5.1 Pharmacodynamic properties**

Pharmacotherapeutic group: antiepileptics, other antiepileptics, ATC code: N03AX23

### Mechanism of action

Brivaracetam displays a high and selective affinity for synaptic vesicle protein 2A (SV2A), a transmembrane glycoprotein found at presynaptic level in neurons and in endocrine cells. Although the exact role of this protein remains to be elucidated it has been shown to modulate exocytosis of neurotransmitters. Binding to SV2A is believed to be the primary mechanism for brivaracetam anticonvulsant activity.

## Clinical efficacy and safety

The efficacy of brivaracetam for the adjunctive therapy of partial onset seizures (POS) was established in 3 randomized, double-blind, placebo-controlled, fixed-dose, multi-center clinical studies in subjects 16 years of age and older. The daily dose of brivaracetam ranged from 5 to 200 mg/day across these studies. All studies had an 8-week baseline period followed by a 12-week treatment period with no up-titration. 1,558 patients received study drug of which 1,099 received brivaracetam. Study enrollment criteria required that patients have uncontrolled POS despite treatment with either 1 or 2 concomitant AEDs. Patients were required to have at least 8 POS during the baseline period. The primary endpoints in the phase 3 studies were the percent reduction in POS frequency over placebo and the 50 % responder rate based on 50 % reduction in POS frequency from baseline.

The most commonly taken AEDs at the time of study entry were carbamazepine (40.6 %), lamotrigine (25.2 %), valproate (20.5 %), oxcarbazepine (16.0 %), topiramate (13.5 %), phenytoin (10.2 %) and levetiracetam (9.8 %). The median baseline seizure frequency across the 3 studies was 9 seizures per 28 days. Patients had a mean duration of epilepsy of approximately 23 years.

The efficacy outcomes are summarized in Table 2. Overall, brivaracetam was efficacious for the adjunctive treatment of partial onset seizures in patients 16 years of age and older between 50 mg/day and 200 mg/day.

*Table 2: Key Efficacy Outcomes for Partial Onset Seizure Frequency per 28 Days*

Study	Placebo	Brivaracetam		
		* Statistically significant (p-value)		
		50 mg/day	100 mg/day	200 mg/day
<b>Study N01253<sup>(1)</sup></b>				
	n= 96	n= 101		
50 % Responder rate	16.7	32.7* (p=0.008)	~	~
Percent reduction over placebo (%)	NA	22.0* (p=0.004)	~	~
<b>Study N01252<sup>(1)</sup></b>				
	n = 100	n = 99	n = 100	
50 % Responder rate	20.0	27.3 (p=0.372)	36.0 <sup>(2)</sup> (p=0.023)	~
Percent reduction over placebo (%)	NA	9.2 (p=0.274)	20.5 <sup>(2)</sup> (p=0.010)	~
<b>Study N01358</b>				
	n = 259		n = 252	n = 249
50% Responder rate	21.6	~	38.9* (p<0.001)	37.8* (p<0.001)
Percent reduction over placebo (%)	NA	~	22.8* (p<0.001)	23.2* (p<0.001)

n = randomised patients who received at least 1 dose of study medication

~ Dose not studied

\* Statistically significant

<sup>(1)</sup> Approximately 20 % of the patients were on concomitant levetiracetam

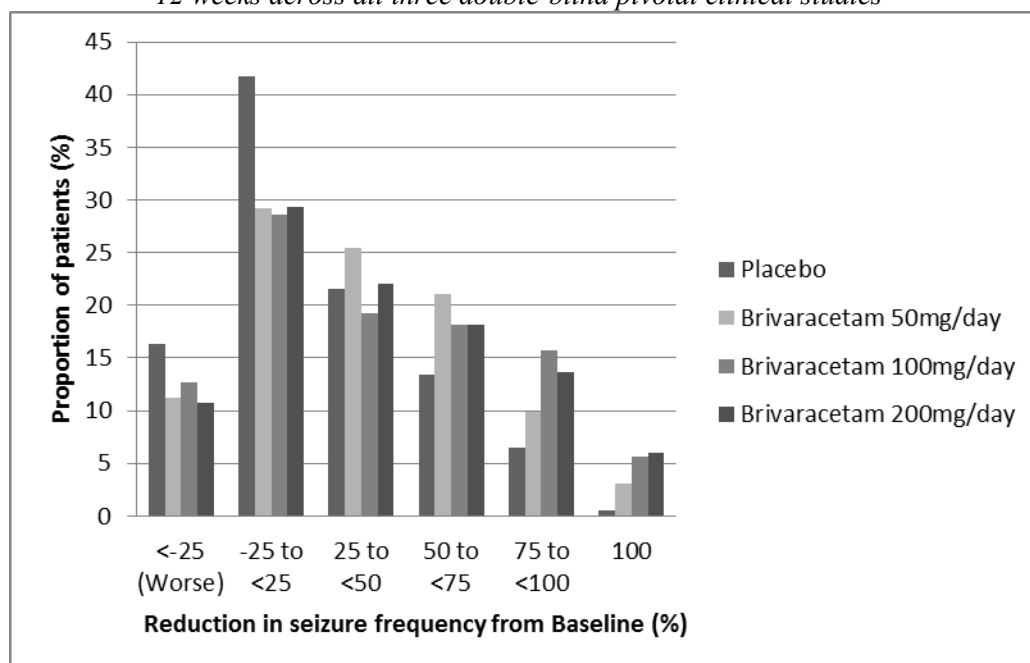
<sup>(2)</sup> The primary outcome for N01252 did not achieve statistical significance based on the sequential testing procedure. The 100 mg/day dose was nominally significant.

In clinical studies, a reduction in seizure frequency over placebo was higher with the dose of 100 mg/day than with 50 mg/day. Apart from dose-dependent increases in incidences of somnolence and fatigue, brivaracetam 50 mg/day and 100 mg/day had a similar safety profile including CNS-related AEs and with long-term use.

Figure 1 shows the percentage of patients (excluding patients with concomitant levetiracetam) by category of reduction from baseline in POS frequency per 28 days in all 3 studies. Patients with more than a 25 % increase in POS are shown at left as “worse”. Patients with an improvement in percent reduction in baseline POS frequency are shown in the 4 right-most categories. The percentages of

patients with at least a 50 % reduction in seizure frequency were 20.3 %, 34.2 %, 39.5 %, and 37.8 % for placebo, 50 mg/day, 100 mg/day, and 200 mg/day, respectively.

*Figure 1: Proportion of patients by category of seizure response for brivaracetam and placebo over 12 weeks across all three double-blind pivotal clinical studies*



In a pooled analysis of the three pivotal clinical studies, no differences in efficacy (measured as 50 % responder rate) was observed within the dose range of 50 mg/day to 200 mg/day when brivaracetam is combined with inducing or non-inducing AEDs. In clinical studies 2.5 % (4/161), 5.1 % (17/332) and 4.0% (10/249) of the patients on brivaracetam 50 mg/day, 100 mg/day and 200 mg/day respectively became seizure free during the 12-week treatment period compared with 0.5 % (2/418) on placebo.

Improvement in the median percent reduction in seizure frequency per 28 days has been observed in patients with type IC seizure (secondary generalized tonic-clonic seizures) at baseline treated with brivaracetam (66.6 % (n=62), 61.2 % (n=100) and 82.1 % (n=75) of the patients on brivaracetam 50 mg/day, 100 mg/day and 200 mg/day respectively as compared to placebo 33.3 % (n=115)).

The efficacy of brivaracetam in monotherapy has not been established. Brivaracetam is not recommended for use in monotherapy.

#### Treatment with levetiracetam

In two phase 3 randomised placebo-controlled clinical studies, levetiracetam was administered as concomitant AED in about 20 % of the patients. Although the number of subjects is limited, there was no observed benefit of brivaracetam versus placebo in patients taking levetiracetam concurrently which may reflect competition at the SV2A binding site. No additional safety or tolerability concerns were observed.

In a third study, a pre-specified analysis demonstrated efficacy over placebo for 100 mg/day and 200 mg/day in patients with prior exposure to levetiracetam. The lower efficacy observed in these patients compared to the levetiracetam-naïve patients was likely due to the higher number of prior AEDs used and higher baseline seizure frequency.

#### *Elderly (65 years of age and above)*

The three pivotal double-blind placebo-controlled clinical studies included 38 elderly patients aged between 65 and 80 years. Although data are limited, the efficacy was comparable to younger subjects.

### *Open label extension studies*

Across all studies, 81.7 % of the patients who completed randomized studies were enrolled in the long-term open-label extension studies. From entry into the randomized studies, 5.3 % of the subjects exposed to brivaracetam for 6 months (n=1,500) were seizure free compared to 4.6 % and 3.7 % for subjects exposed for 12 months (n=1,188) and 24 months (n=847), respectively. However, as a high proportion of subjects (26%) discontinued from the open-label studies due to lack of efficacy, a selection bias may have occurred, as the subjects who stayed in the study responded better than those who have terminated prematurely.

In patients who were followed up in the open-label extension studies for up to 8 years, the safety profile was similar to that observed in the short-term, placebo-controlled studies.

### Paediatric population

In children aged 2 years and older, partial onset seizures have a similar pathophysiology to those in adolescents and adults. Experience with epilepsy medicines suggests that the results of efficacy studies performed in adults can be extrapolated to children down to the age of 2 years provided the paediatric dose adaptations are established and safety has been demonstrated (see sections 5.2 and 4.8). Doses in patients from 2 years of age were defined by weight-based dose adaptations which have been established to achieve similar plasma concentrations to the ones observed in adults taking efficacious doses (section 5.2).

A long-term, uncontrolled, open-label safety study included children (from 1 month of age to less than 16 years) who continued treatment after completing the PK study (see section 5.2), children who continued treatment after completing the i.v. (intravenous) safety study and children directly enrolled into the safety study. Children who directly enrolled received a brivaracetam starting dose of 1 mg/kg/day and depending on response and tolerability, the dose was increased up to 5 mg/kg/day by doubling the dose at weekly intervals. No child received a dose greater than 200 mg/day. For children weighing 50 kg or greater the brivaracetam starting dose was 50 mg/day and depending on response and tolerability, the dose was increased up to a maximum of 200 mg/day by weekly increments of 50 mg/day.

From the pooled open-label safety and PK studies in adjunctive therapy, 186 children with POS in the age range of 1 month < 16 years of age have received brivaracetam, of whom 149 have been treated for  $\geq 3$  months, 138 for  $\geq 6$  months, 123 for  $\geq 12$  months, 107 for  $\geq 24$  months, and 90 for  $\geq 36$  months.

The European Medicines Agency has deferred the obligation to submit the results of studies with brivaracetam in one or more subsets of the paediatric population in epilepsy with partial onset seizures (see section 4.2 for information on paediatric use).

## **5.2 Pharmacokinetic properties**

Brivaracetam film-coated tablets, oral solution and solution for intravenous injection show the same AUC, while the maximum plasma concentration is slightly higher after intravenous administration. Brivaracetam exhibits linear and time-independent pharmacokinetics with low intra- and inter-subject variability, and features complete absorption, very low protein binding, renal excretion following extensive biotransformation, and pharmacologically inactive metabolites.

### Absorption

Brivaracetam is rapidly and completely absorbed after oral administration and the absolute bioavailability is approximately 100 %. The median  $t_{\max}$  for tablets taken without food is 1 hour ( $t_{\max}$  range is 0.25 to 3 h).

Coadministration with a high-fat meal slowed down the absorption rate (median  $t_{\max}$  3 h) and decreased the maximum plasma concentration (37 % lower) of brivaracetam, while the extent of absorption remained unchanged.

## Distribution

Brivaracetam is weakly bound ( $\leq 20\%$ ) to plasma proteins. The volume of distribution is 0.5 L/kg, a value close to that of the total body water.

Due to its lipophilicity (Log P) brivaracetam has high cell membrane permeability.

## Biotransformation

Brivaracetam is primarily metabolized by hydrolysis of the amide moiety to form the corresponding carboxylic acid (approximately 60 % the elimination), and secondarily by hydroxylation on the propyl side chain (approximately 30 % the elimination). The hydrolysis of the amide moiety leading to the carboxylic acid metabolite (34 % of the dose in urine) is supported by hepatic and extra-hepatic amidase. *In vitro*, the hydroxylation of brivaracetam is mediated primarily by CYP2C19. Both metabolites, are further metabolised forming a common hydroxylated acid formed predominantly by hydroxylation of the propyl side chain on the carboxylic acid metabolite (mainly by CYP2C9). *In vivo*, in human subjects possessing ineffective mutations of CYP2C19, production of the hydroxy metabolite is decreased 10-fold while brivaracetam itself is increased by 22 % or 42 % in individuals with one or both mutated alleles. The three metabolites are not pharmacologically active.

## Elimination

Brivaracetam is eliminated primarily by metabolism and by excretion in the urine. More than 95 % of the dose, including metabolites, is excreted in the urine within 72 hours after intake. Less than 1 % of the dose is excreted in faeces and less than 10 % of brivaracetam is excreted unchanged in urine. The terminal plasma half-life ( $t_{1/2}$ ) is approximately 9 hours. The total plasma clearance in patients was estimated to 3.6 L/h.

## Linearity

Pharmacokinetics is dose-proportional from 10 to at least 600 mg.

## Interactions with medicinal products

Brivaracetam is cleared by multiple pathways including renal excretion, non-CYP-mediated hydrolysis and CYP-mediated oxidations. *In vitro*, brivaracetam is not a substrate of human P-glycoprotein (P-gp), multidrug resistance proteins (MRP) 1 and 2, and likely not organic anion transporter polypeptide 1B1 (OATP1B1) and OATP1B3.

*In vitro* assays showed that brivaracetam disposition should not be significantly affected by CYP (eg. CYP1A, CYP2C8, CYP2C9, CYP2D6 and CYP3A4) inhibitors.

*In vitro*, brivaracetam was not an inhibitor of the CYP1A2, CYP2A6, CYP2B6, CYP2C8, CYP2C9, CYP2D6, CYP3A4, or the transporters P-gp, BCRP, BSEP, MRP2, MATE-K, MATE-1, OATP1B1, OATP1B3, OAT1 and OCT1 at clinically relevant concentrations. *In vitro*, brivaracetam did not induce CYP1A2.

## Pharmacokinetics in special patient groups

### *Elderly (65 years of age and above)*

In a study in elderly subjects (65 to 79 years old; with creatinine clearance 53 to 98 ml/min/1.73 m<sup>2</sup>) receiving brivaracetam 400 mg/day in bid administration, the plasma half-life of brivaracetam was 7.9 hours and 9.3 hours in the 65 to 75 and >75 years groups, respectively. The steady-state plasma clearance of brivaracetam was similar (0.76 ml/min/kg) to young healthy male subjects (0.83 ml/min/kg) (see section 4.2).

#### *Renal impairment*

A study in subjects with severe renal impairment (creatinine clearance < 30 ml/min/1.73 m<sup>2</sup> and not requiring dialysis) revealed that the plasma AUC of brivaracetam was moderately increased (+21 %) relative to healthy controls, while the AUC of the acid, hydroxy and hydroxyacid metabolites were increased 3-, 4-, and 21-fold, respectively. The renal clearance of these non active metabolites was decreased 10-fold. The hydroxyacid metabolite did not reveal any safety concerns in non clinical studies. Brivaracetam has not been studied in patients undergoing hemodialysis (see section 4.2).

#### *Hepatic impairment*

A pharmacokinetic study in subjects with hepatic cirrhosis (Child-Pugh classes A, B, and C) showed similar increases in exposure to brivaracetam irrespective of disease severity (50 %, 57 % and 59 %), relative to matched healthy controls. (see section 4.2).

#### *Body weight*

A 40 % decrease in steady-state plasma concentration has been estimated across a body weight range from 46 kg to 115 kg. However, this is not considered to be a clinically relevant difference.

#### *Gender*

There are no clinically relevant differences in the pharmacokinetics of brivaracetam by gender.

#### *Race*

The pharmacokinetics of brivaracetam was not significantly affected by race (Caucasian, Asian) in a population pharmacokinetic modeling from epilepsy patients. The number of patients with other ethnic background was limited.

#### Pharmacokinetic/pharmacodynamics relationship

The EC<sub>50</sub> (brivaracetam plasma concentration corresponding to 50 % of the maximum effect) was estimated to be 0.57 mg/L. This plasma concentration is slightly above the median exposure obtained after brivaracetam doses of 50 mg/day. Further seizure frequency reduction is obtained by increasing the dose to 100 mg/day and reaches a plateau at 200 mg/day.

#### Paediatric population

In a pharmacokinetic study with a 3-week evaluation period and weekly fixed 3-step up-titration using the brivaracetam oral solution, 99 subjects aged 1 month to < 16 years were evaluated. Brivaracetam was administered at weekly increasing doses of approximately 1 mg/kg/day, 2 mg/kg/day, and 4 mg/kg/day. All doses were adjusted by body weight, and did not exceed a maximum of 50 mg/day, 100 mg/day, and 200 mg/day. At the end of the evaluation period, subjects may have been eligible for entry into a long-term follow-up study continuing on their last received dose (see section 4.8). Plasma concentrations were shown to be dose-proportional in all age groups. Population pharmacokinetics modeling was performed based on sparse plasma concentration data collected in the 3-week PK study and the ongoing long-term follow-up study. 232 paediatric patients with epilepsy, aged 2 months to 17 years, were included in the analysis. The analysis indicated that doses of 5.0 (body weights 10-20 kg) and 4.0 mg/kg/day (body weights 20-50 kg) provide the same steady-state average plasma concentration as in adults receiving 200 mg/day. The estimated plasma clearance was 0.96 L/h, 1.61 L/h, 2.18 L/h and 3.19 L/h for children weighing 10 kg, 20 kg, 30 kg and 50 kg, respectively. In comparison, plasma clearance was estimated at 3.58 L/h in adult patients (70 kg body weight). Currently, no clinical data are available in neonates.

### **5.3 Preclinical safety data**

In safety pharmacology studies, the predominant effects were CNS related (mainly transient CNS depression and decreased spontaneous locomotor activity) seen at multiples (greater than 50 fold) of the pharmacologically active dose of brivaracetam, 2 mg/kg. Learning and memory function were not affected.



Findings not observed in clinical studies, but seen in the repeated-dose toxicology dog studies at exposure similar to the clinical plasma AUC, were hepatotoxic effects (mainly porphyria). However, toxicological data accumulated on brivaracetam and on a structurally-related compound indicate that the dog liver changes have developed through mechanisms not relevant for humans. No adverse liver changes were seen in rats and monkeys following chronic administration of brivaracetam at 5- and 42-fold the clinical AUC exposure. In monkeys, CNS signs (prostrate, loss of balance, clumsy movements) occurred at 64 fold the clinical  $C_{max}$ , these effects being less apparent over time.

Genotoxicity studies have not detected any mutagenic or clastogenic activity. Carcinogenicity studies did not indicate any oncogenic potential in rats, whereas increased incidences of hepatocellular tumors in male mice are considered to result of a non-genotoxic, mode of action linked to a phenobarbitone-like liver enzyme induction, which is a known rodent specific phenomenon.

Brivaracetam did not affect male or female fertility and has demonstrated no teratogenic potential in either rat or rabbit. Embryotoxicity was observed in rabbits at a maternal toxic dose of brivaracetam with an exposure level 8-fold the clinical AUC exposure at the maximum recommended dose. In rats, brivaracetam was shown to readily cross the placenta and to be excreted in milk of lactating rats with concentrations similar to maternal plasma levels.

Brivaracetam did not show any dependence potential in rats.

#### Juvenile animals studies

In juvenile rats, brivaracetam exposure levels 6- to 15-fold the clinical AUC exposure at the maximum recommended dose induced developmental adverse effects (i.e. mortality, clinical signs, decreased body weight and lower brain weight). There were no adverse effects on CNS function, neuropathological and brain histopathological examination. In juvenile dogs, the brivaracetam-induced changes at the exposure level 6- fold the clinical AUC were similar to those observed in adult animals. There were no adverse effects in any of the standard developmental or maturation endpoints.

## **6. PHARMACEUTICAL PARTICULARS**

### **6.1 List of excipients**

#### Core

Croscarmellose sodium,  
Lactose monohydrate  
Betadex  
Lactose anhydrous  
Magnesium stearate

#### Coating

##### *Briviact 10 mg film-coated tablets*

Poly(vinyl alcohol)  
Titanium dioxide (E171)  
Macrogol (3350)  
Talc

##### *Briviact 25 mg film-coated tablets*

Poly(vinyl alcohol)  
Titanium dioxide (E171)  
Macrogol (3350)  
Talc  
Iron oxide yellow (E172)

Iron oxide black (E172)

*Briviact 50 mg film-coated tablets*

Poly(vinyl alcohol)

Titanium dioxide (E171)

Macrogol (3350)

Talc

Iron oxide yellow (E172)

Iron oxide red (E172)

*Briviact 75 mg film-coated tablets*

Poly(vinyl alcohol)

Titanium dioxide (E171)

Macrogol (3350)

Talc

Iron oxide yellow (E172)

Iron oxide red (E172)

Iron oxide black (E172)

*Briviact 100 mg film-coated tablets*

Poly(vinyl alcohol)

Titanium dioxide (E171)

Macrogol (3350)

Talc

Iron oxide yellow (E172)

Iron oxide black (E172)

## **6.2 Incompatibilities**

Not applicable

## **6.3 Shelf life**

5 years.

## **6.4 Special precautions for storage**

This medicinal product does not require any special storage conditions.

## **6.5 Nature and contents of container**

### Briviact 10 mg film-coated tablets

- Packs of 14, 56 film-coated tablets and multipacks containing 168 (3 packs of 56) film-coated tablets in PVC/PCTFE - Aluminium blisters
- Packs of 14 x 1 and 100 x 1 film-coated tablets in PVC/PCTFE - Aluminium blisters

### Briviact 25 mg film-coated tablets

- Packs of 14, 56 film-coated tablets and multipacks containing 168 (3 packs of 56) film-coated tablets in PVC/PCTFE - Aluminium blisters
- Packs of 14 x 1 and 100 x 1 film-coated tablets in PVC/PCTFE - Aluminium blisters

### Briviact 50 mg film-coated tablets

- Packs of 14, 56 film-coated tablets and multipacks containing 168 (3 packs of 56) film-coated tablets in PVC/PCTFE - Aluminium blisters
- Packs of 14 x 1 and 100 x 1 film-coated tablets in PVC/PCTFE - Aluminium blisters

#### Briviact 75 mg film-coated tablets

- Packs of 14, 56 film-coated tablets and multipacks containing 168 (3 packs of 56) film-coated tablets in PVC/PCTFE - Aluminium blisters
- Packs of 14 x 1 and 100 x 1 film-coated tablets in PVC/PCTFE - Aluminium blisters

#### Briviact 100 mg film-coated tablets

- Packs of 14, 56 film-coated tablets and multipacks containing 168 (3 packs of 56) film-coated tablets in PVC/PCTFE - Aluminium blisters
- Packs of 14 x 1 and 100 x 1 film-coated tablets in PVC/PCTFE - Aluminium blisters

Not all pack sizes may be marketed.

### **6.6 Special precautions for disposal**

No special requirements.

Any unused medicinal product or waste material should be disposed of in accordance with local requirements.

## **7. MARKETING AUTHORISATION HOLDER**

UCB Pharma S.A.  
Allée de la Recherche 60  
B-1070 Bruxelles  
Belgium

## **8. MARKETING AUTHORISATION NUMBER(S)**

EU/1/15/1073/001  
EU/1/15/1073/002  
EU/1/15/1073/003  
EU/1/15/1073/004  
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EU/1/15/1073/026  
EU/1/15/1073/027

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

Date of first authorisation: 14 January 2016

Date of latest renewal: 9 October 2020

## **10. DATE OF REVISION OF THE TEXT**

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

## 1. NAME OF THE MEDICINAL PRODUCT

Briviact 10 mg/ml oral solution

## 2. QUALITATIVE AND QUANTITATIVE COMPOSITION

Each ml contains 10 mg brivaracetam.

### Excipient(s) with known effect

Each ml of oral solution contains 168 mg sorbitol (E420), 1 mg methyl parahydroxybenzoate (E218) and maximum 5.5 mg propylene glycol (E1520).

For the full list of excipients, see section 6.1.

## 3. PHARMACEUTICAL FORM

Oral solution

Slightly viscous, clear colourless to yellowish liquid.

## 4. CLINICAL PARTICULARS

### 4.1 Therapeutic indications

Briviact is indicated as adjunctive therapy in the treatment of partial onset seizures with or without secondary generalisation in adults, adolescents and children from 2 years of age with epilepsy.

### 4.2 Posology and method of administration

#### Posology

The physician should prescribe the most appropriate formulation and strength according to weight and dose. It is recommended to parent and care giver to administer Briviact oral solution with the measuring device (10 ml or 5 ml oral dosing syringe) provided in the carton box.

The recommended posology for adults, adolescents and children from 2 years of age is summarised in the following table. The dose should be administered in two equally divided doses, approximately 12 hours apart.

Recommended starting dose	Recommended maintenance dose	Therapeutic dose range*
<b>Adolescents and children weighing 50 kg or more, and adults</b>		
50 mg/day (or 100 mg/day)**	100 mg/day	50 - 200 mg/day
<b>Adolescents and children weighing from 20 kg to less than 50 kg</b>		
1 mg/kg/day (up to 2 mg/kg/day)**	2 mg/kg/day	1 – 4 mg/kg/day
<b>Children weighing from 10 kg to less than 20 kg</b>		
1 mg/kg/day (up to 2.5 mg/kg/day)**	2.5 mg/kg/day	1 – 5 mg/kg/day

\* Based on individual patient response, the dose may be adjusted within this effective dose range.

\*\* Based on physician's assessment of need for seizure control

### *Adults*

The recommended starting dose is either 50 mg/day or 100 mg/day based on physician's assessment of required seizure reduction versus potential side effects. Based on individual patient response and tolerability, the dose may be adjusted in the effective dose range of 50 mg/day to 200 mg/day.

### *Adolescents and children weighing 50 kg or more*

The recommended starting dose is 50 mg/day. Brivaracetam may also be initiated at 100 mg/day based on physician's assessment of need for seizure control. The recommended maintenance dose is 100 mg/day. Based on individual patient response, the dose may be adjusted in the effective dose range of 50 mg/day to 200 mg/day.

### *Adolescents and children weighing from 20 kg to less than 50 kg*

The recommended starting dose is 1mg/kg/day. Brivaracetam may also be initiated at doses up to 2 mg/kg/day based on physician's assessment of need for seizure control. The recommended maintenance dose is 2 mg/kg/day. Based on individual patient response, the dose may be adjusted in the effective dose range of 1 mg/kg/day to 4 mg/kg/day.

### *Children weighing from 10 kg to less than 20 kg*

The recommended starting dose is 1 mg/kg/day. Brivaracetam may also be initiated at doses up to 2.5 mg/kg/day based on physician's assessment of need for seizure control. The recommended maintenance dose is 2.5 mg/kg/day. Based on individual patient response, the dose may be adjusted in the effective dose range of 1 mg/kg/day to 5 mg/kg/day.

The dose per intake for each patient should be calculated using the following formula:

$$\text{Volume per administration (ml)} = [\text{weight (kg)} \times \text{daily dose (mg/kg/day)}] \times 0.05$$

Briviact oral solution is provided with:

- a 5 ml syringe (blue graduation marks) graduated every 0.1 ml increments (each 0.1 ml increment corresponds to 1 mg of brivaracetam). Additional graduations at 0.25 ml and 0.75 ml starting at 0.25 ml up to 5 ml are shown.
- a 10 ml syringe (black graduation marks) graduated in 0.25 ml increments (each 0.25 ml increment corresponds to 2.5 mg of brivaracetam).

The physician should instruct the patient on the appropriate syringe to use.

If the calculated dose per intake is 5 mg (0.5 ml) or more and up to 50 mg (5 ml), the 5 ml oral syringe should be used.

If the calculated dose per intake is more than 50 mg (5 ml), the larger 10 ml oral syringe should be used.

The calculated dose should be rounded to the nearest graduated increment. If the calculated dose is equidistant between two graduated increments, the larger graduated increment should be used.

The table below provides examples of volumes of oral solution per intake depending on prescribed dose and body weight. The precise volume of oral solution is to be calculated according to the exact body weight of the child.

Note that the dosage is limited to the available graduations of the syringes. For example, for a patient that needs a dose of 2.15 ml, the applied volume needs to be rounded up to 2.2 ml as the 5 ml syringe can only deliver 2.1 ml or 2.2 ml. Likewise a volume of 1.13 ml would need to be rounded down to a delivered volume of 1.1 ml.

Volumes of oral solution to be taken per administration for adolescents and children weighing 50 kg or more, and adults				
Prescribed dose	<i>For a dose of 50 mg/day</i> <b>25 mg/intake</b>	<i>For a dose of 100 mg/day</i> <b>50 mg/intake</b>	<i>For a dose of 150 mg/day</i> <b>75 mg/intake</b>	<i>For a dose of 200 mg/day</i> <b>100 mg/intake</b>
Recommended syringe	<b>5 ml</b>		<b>10 ml</b>	
Weight	<b>Volume administered</b>		<b>Volume administered</b>	
50 kg or more	2.5 ml (25 mg)	5 ml (50 mg)	7.5 ml (75 mg)	10 ml (100 mg)

Volumes of oral solution to be taken per administration for adolescents and children weighing from 20 kg to less than 50 kg				
Prescribed dose	<i>For a dose of 1 mg/kg/day</i> <b>0.05 ml/kg/intake</b>  (corresponding to 0.5 mg/kg/intake)	<i>For a dose of 2 mg/kg/day</i> <b>0.1 ml/kg/intake</b>  (corresponding to 1 mg/kg/intake)	<i>For a dose of 3 mg/kg/day</i> <b>0.15 ml/kg/intake</b>  (corresponding to 1.5 mg/kg/intake)	<i>For a dose of 4 mg/kg/day</i> <b>0.2 ml/kg/intake</b>  (corresponding to 2 mg/kg/intake)
Recommended syringe	<b>5 ml</b>		<b>5 ml or 10 ml*</b>	
Weight	<b>Volume administered</b>		<b>Volume administered</b>	
20 kg	1 ml (10 mg)	2 ml (20 mg)	3 ml (30 mg)	4 ml (40 mg)
25 kg	1.25 ml (12.5 mg)	2.5 ml (25 mg)	3.75 ml (37.5 mg)	5 ml (50 mg)
30 kg	1.5 ml (15 mg)	3 ml (30 mg)	4.5 ml (45 mg)	6 ml* (60 mg)
35 kg	1.75 ml (17.5 mg)	3.5 ml (35 mg)	5.25 ml* (52.5 mg)	7 ml* (70 mg)
40 kg	2 ml (20 mg)	4 ml (40 mg)	6 ml* (60 mg)	8 ml* (80 mg)
45 kg	2.25 ml (22.5 mg)	4.5 ml (45mg)	6.75 ml* (67.5 mg)	9 ml* (90 mg)
* For volume above 5 ml and up to 10 ml, the patient should be instructed to use the 10 ml oral syringe				

Volumes of oral solution to be taken per administration for children weighing from 10 kg to less than 20 kg					
Prescribed dose	For a dose of 1 mg/kg/day  0.05 ml/kg/intake  (corresponding to 0.5 mg/kg/intake)	For a dose of 2.5 mg/kg/day  0.125 ml/kg/intake  (corresponding to 1.25 mg/kg/intake)	For a dose of 3 mg/kg/day  0.15 ml/kg/intake  (corresponding to 1.5 mg/kg/intake)	For a dose of 4 mg/kg/day  0.2 ml/kg/intake  (corresponding to 2 mg/kg/intake)	For a dose of 5 mg/kg/day  0.25 ml/kg/intake  (corresponding to 2.5 mg/kg/intake)
Recommended syringe: 5 ml					
Weight	Volume administered				
10 kg	0.5 ml (5 mg)	1.25 ml (12.5 mg)	1.5 ml (15 mg)	2 ml (20 mg)	2.5 ml (25 mg)
12 kg	0.6 ml (6 mg)	1.5 ml (15 mg)	1.8 ml (18 mg)	2.4 ml (24 mg)	3.0 ml (30 mg)
14 kg	0.7 ml (7 mg)	1.75 ml (17.5 mg)	2.1 ml (21 mg)	2.8 ml (28 mg)	3.5 ml (35 mg)
15 kg	0.75 ml (7.5 mg)	1.9 ml (19.0 mg)	2.25 ml (22.5 mg)	3 ml (30 mg)	3.75 ml (37.5 mg)

#### *Missed doses*

If patients missed one dose or more, it is recommended that they take a single dose as soon as they remember and take the following dose at the usual morning or evening time. This may avoid the brivaracetam plasma concentration falling below the efficacy level and prevent breakthrough seizures from occurring.

#### *Discontinuation*

For patients from 16 years of age, if brivaracetam has to be discontinued, it is recommended that the dose is reduced gradually by 50 mg/day on a weekly basis.

For patients below the age of 16 years, if brivaracetam has to be discontinued, it is recommended that the dose is reduced by a maximum of half the dose every week until a dose of 1 mg/kg/day (for patients with a body weight less than 50 kg) or 50 mg/day (for patients with body weight of 50 kg or more) is reached.

After 1 week of treatment at 50 mg/day, a final week of treatment at the dose of 20 mg/day is recommended.

#### Special populations

##### *Elderly (65 years of age and above)*

No dose adjustment is needed in elderly patients (see section 5.2).

The clinical experience in patients  $\geq 65$  years is limited.

##### *Renal impairment*

No dose adjustment is needed in patients with impaired renal function (see section 5.2). Brivaracetam is not recommended in end-stage renal disease patients undergoing dialysis due to lack of data.

Based on data in adults, no dose adjustment is necessary in paediatric patients with impaired renal function. No clinical data are available in paediatric patients with renal impairment.

##### *Hepatic impairment*

Exposure to brivaracetam was increased in adult patients with chronic liver disease.

In patients with hepatic impairment, the following adjusted doses, administered in 2 divided doses, approximately 12 hours apart, are recommended for all stages of hepatic impairment (see sections 4.4 and 5.2). No clinical data are available in paediatric patients with hepatic impairment.



<b>Age and body weight</b>	<b>Recommended starting dose</b>	<b>Recommended maximum daily dose</b>
Adolescents and children weighing 50 kg or more, and adults	50 mg/day	150 mg/day
Adolescents and children weighing from 20 kg to less than 50 kg	1 mg/kg/day	3 mg/kg/day
Children weighing from 10 kg to less than 20 kg	1 mg/kg/day	4 mg/kg/day

#### *Paediatric patients less than 2 years of age*

The efficacy of brivaracetam in paediatric patients aged less than 2 years has not yet been established. Currently available data are described in section 4.8, 5.1, and 5.2 but no recommendation on a posology can be made.

#### Method of administration

Brivaracetam oral solution can be diluted in water or juice shortly before swallowing and may be taken with or without food (see section 5.2). A nasogastric tube or a gastrostomy tube may be used when administering brivaracetam oral solution.

Briviact oral solution is provided with a 5 ml and a 10 ml oral dosing syringe with their adaptor.

Instructions for use are provided in the package leaflet.

### **4.3 Contraindications**

Hypersensitivity to the active substance or other pyrrolidone derivatives or to any of the excipients listed in section 6.1.

### **4.4 Special warnings and precautions for use**

#### Suicidal ideation and behaviour

Suicidal ideation and behaviour have been reported in patients treated with anti-epileptic drugs (AEDs), including brivaracetam, in several indications. A meta-analysis of randomized placebo-controlled clinical studies of AEDs has also shown a small increased risk of suicidal ideation and behaviour. The mechanism of this risk is not known and the available data do not exclude the possibility of an increased risk for brivaracetam.

Patients should be monitored for signs of suicidal ideation and behaviours and appropriate treatment should be considered. Patients (and caregivers of patients) should be advised to seek medical advice should any signs of suicidal ideation or behaviour emerge. See also section 4.8, paediatric data.

#### Hepatic impairment

There are limited clinical data on the use of brivaracetam in patients with pre-existing hepatic impairment. Dose adjustments are recommended for patients with hepatic impairment (see section 4.2).

#### Severe cutaneous adverse reactions (SCARs)

Severe cutaneous adverse reactions (SCARs) including Stevens-Johnson syndrome (SJS), which can be life-threatening or fatal, have been reported in association with brivaracetam treatment. At the time of the prescription patients should be advised of the signs and symptoms and monitored closely for skin reactions. If signs and symptoms suggestive of these reactions appear, brivaracetam should be withdrawn immediately and an alternative treatment should be considered.

## Excipients

### *Sodium content*

Brivaracetam oral solution contains less than 1 mmol sodium (23mg) per ml, that is to say essentially 'sodium free'.

### *Fructose intolerance*

This medicine contains 168 mg sorbitol (E420) in each ml. Patients with hereditary fructose intolerance (HFI) should not take this medicinal product.

### *Excipients which may cause intolerance*

The oral solution contains methyl parahydroxybenzoate (E218), which may cause allergic reactions (possibly delayed).

Brivaracetam oral solution contains propylene glycol (E1520).

## **4.5 Interaction with other medicinal products and other forms of interaction**

Formal interaction studies have only been performed in adults.

### Pharmacodynamic interactions

#### *Concomitant treatment with levetiracetam*

In the clinical studies, although the numbers were limited, there was no observed benefit of brivaracetam versus placebo in patients taking levetiracetam concurrently. No additional safety or tolerability concern was observed (see section 5.1).

#### *Interaction with alcohol*

In a pharmacokinetic and pharmacodynamic interaction study between brivaracetam 200 mg single dose and ethanol 0.6 g/L continuous infusion in healthy subjects, there was no pharmacokinetic interaction, but brivaracetam approximately doubled the effect of alcohol on psychomotor function, attention and memory. Intake of brivaracetam with alcohol is not recommended.

### Pharmacokinetic interactions

#### *Effects of other medicinal products on the pharmacokinetics of brivaracetam*

*In vitro* data suggest that brivaracetam has a low interaction potential. The main disposition pathway of brivaracetam is by CYP-independent hydrolysis. A second disposition pathway involves hydroxylation mediated by CYP2C19 (see section 5.2).

Brivaracetam plasma concentrations may increase when coadministered with CYP2C19 strong inhibitors (e.g. fluconazole, fluvoxamine), but the risk of a clinically relevant CYP2C19-mediated interaction is considered to be low. Limited clinical data are available implying that coadministration of cannabidiol may increase the plasma exposure of brivaracetam, possibly through CYP2C19 inhibition, but the clinical relevance is uncertain.

#### *Rifampicin*

In healthy subjects, coadministration with the strong enzyme inducer rifampicin (600 mg/day for 5 days), decreased brivaracetam area under the plasma concentration curve (AUC) by 45 %. Prescribers should consider adjusting the brivaracetam dose in patients starting or ending treatment with rifampicin.

#### *Strong enzyme inducing AEDs*

Brivaracetam plasma concentrations are decreased when coadministered with strong enzyme inducing AEDs (carbamazepine, phenobarbital, phenytoin) but no dose adjustment is required (see table 1).

### Other enzyme inducers

Other strong enzyme inducers (such as St John's wort (*Hypericum perforatum*)) may also decrease the systemic exposure of brivaracetam. Therefore, starting or ending treatment with St John's wort should be done with caution.

### Effects of brivaracetam on other medicinal products

Brivaracetam given 50 or 150 mg/day did not affect the AUC of midazolam (metabolised by CYP3A4). The risk of clinically relevant CYP3A4 interactions is considered to be low.

*In vitro* studies have shown that brivaracetam exhibits little or no inhibition of CYP450 isoforms except for CYP2C19. Brivaracetam may increase plasma concentrations of medicinal products metabolised by CYP2C19 (e.g. lansoprazole, omeprazole, diazepam). When tested *in vitro* brivaracetam did not induce CYP1A1/2 but induced CYP3A4 and CYP2B6. No CYP3A4 induction was found *in vivo* (see midazolam above). CYP2B6 induction has not been investigated *in vivo* and brivaracetam may decrease plasma concentrations of medicinal products metabolised by CYP2B6 (e.g. efavirenz). *In vitro*, interaction studies to determine the potential inhibitory effects on transporters concluded that there were no clinically relevant effects, except for OAT3. *In vitro*, brivaracetam inhibits OAT3 with a half maximal inhibitory concentration 42-fold higher than the  $C_{max}$  at the highest clinical dose. Brivaracetam 200mg/day may increase plasma concentrations of medicinal products transported by OAT3.

### Antiepileptic drugs

Potential interactions between brivaracetam (50 mg/day to 200 mg/day) and other AEDs were investigated in a pooled analysis of plasma drug concentrations from all phase 2-3 studies in a population pharmacokinetic analysis of placebo-controlled phase 2-3 clinical studies, and in dedicated drug-drug interaction studies (for the following AEDs: carbamazepine, lamotrigine, phenytoin and topiramate). The effect of the interactions on the plasma concentration is summarised in table 1 (increase is indicated as “↑” and decrease as “↓”, area under the plasma concentration versus time curve as “AUC”, maximum observed concentration as  $C_{max}$ ).

Table 1: Pharmacokinetic interactions between brivaracetam and other AEDs

AED coadministered	Influence of AED on brivaracetam plasma concentration	Influence of brivaracetam on AED plasma concentration
Carbamazepine	AUC 29 % ↓ $C_{max}$ 13 % ↓ No dose adjustment required	Carbamazepine - None Carbamazepine-epoxide ↑ (See below) No dose adjustment required.
Clobazam	No data available	None
Clonazepam	No data available	None
Lacosamide	No data available	None
Lamotrigine	None	None
Levetiracetam	None	None
Oxcarbazepine	None	None (monohydroxy derivative, MHD)
Phenobarbital	AUC 19 % ↓ No dose adjustment required	None
Phenytoin	AUC 21 % ↓ No dose adjustment required	None <sup>a</sup> AUC 20% ↑ <sup>a</sup> $C_{max}$ 20% ↑
Pregabalin	No data available	None
Topiramate	None	None
Valproic acid	None	None
Zonisamide	No data available	None

<sup>a</sup> based on a study involving the administration of a supratherapeutic dose of 400 mg/day brivaracetam

### *Carbamazepine*

Brivaracetam is a moderate reversible inhibitor of epoxide hydrolase resulting in an increased concentration of carbamazepine epoxide, an active metabolite of carbamazepine. In controlled clinical studies, the carbamazepine epoxide plasma concentration increased by a mean of 37 %, 62 % and 98 % with little variability at brivaracetam doses of 50 mg/day, 100 mg/day and 200 mg/day respectively. No safety risks were observed. There was no additive effect of brivaracetam and valproate on the AUC of carbamazepine epoxide.

### Oral contraceptives

Co-administration of brivaracetam (100 mg/day) with an oral contraceptive containing ethinylestradiol (0.03 mg) and levonorgestrel (0.15 mg) did not influence the pharmacokinetics of either substance. When brivaracetam was coadministered at a dose of 400 mg/day (twice the recommended maximum daily dose) with an oral contraceptive containing ethinylestradiol (0.03 mg) and levonorgestrel (0.15 mg), a reduction in oestrogen and progestin AUCs of 27 % and 23 %, respectively, was observed without impact on suppression of ovulation. There was generally no change in the concentration-time profiles of the endogenous markers estradiol, progesterone, luteinizing hormone (LH), follicle stimulating hormone (FSH), and sex hormone binding globulin (SHBG).

## **4.6 Fertility, pregnancy and lactation**

### Women of childbearing potential

Physicians should discuss family planning and contraception with women of childbearing potential taking brivaracetam (see Pregnancy).

If a woman decides to become pregnant, the use of brivaracetam should be carefully re-evaluated.

### Pregnancy

#### *Risk related to epilepsy and antiepileptic medicinal products in general*

For all anti-epileptic drugs, it has been shown that in the offspring of treated women with epilepsy, the prevalence of malformations is two to three times greater than the rate of approximately 3 % in the general population. In the treated population, an increase in malformations has been noted with polytherapy; however, the extent to which the treatment and/or the underlying condition is responsible has not been elucidated. Discontinuation of anti-epileptic treatments may result in exacerbation of the disease which could be harmful to the mother and the foetus.

#### *Risk related to brivaracetam*

There is a limited amount of data from the use of brivaracetam in pregnant women. There is no data on placental transfer in humans, but brivaracetam was shown to readily cross the placenta in rats (see section 5.3). The potential risk for humans is unknown. Animal studies did not detect any teratogenic potential of brivaracetam (see section 5.3).

In clinical studies, brivaracetam was used as adjunctive therapy and when it was used with carbamazepine, it induced a dose-related increase in the concentration of the active metabolite, carbamazepine-epoxide (see section 4.5). There is insufficient data to determine the clinical significance of this effect in pregnancy.

As a precautionary measure, brivaracetam should not be used during pregnancy unless clinically necessary i.e. (if the benefit to the mother clearly outweighs the potential risk to the foetus).

### Breast-feeding

Brivaracetam is excreted in human breast milk. A decision should be made whether to discontinue breastfeeding or to discontinue brivaracetam, taking into account the benefit of the medicinal product to the mother. In case of co-administration of brivaracetam and carbamazepine, the amount of

carbamazepine-epoxide excreted in breast milk could increase. There is insufficient data to determine the clinical significance.

### Fertility

No human data on the effect of brivaracetam on fertility are available. In rats, there was no effect on fertility with brivaracetam (see section 5.3).

## **4.7 Effects on ability to drive and use machines**

Brivaracetam has minor or moderate influence on the ability to drive and use machines.

Due to possible differences in individual sensitivity some patients might experience somnolence, dizziness, and other central nervous system (CNS) related symptoms. Patients should be advised not to drive a car or to operate other potentially hazardous machines until they are familiar with the effects of brivaracetam on their ability to perform such activities.

## **4.8 Undesirable effects**

### Summary of the safety profile

The most frequently reported adverse reactions (>10 %) with brivaracetam treatment were: somnolence (14.3 %) and dizziness (11.0 %). They were usually mild to moderate in intensity. Somnolence and fatigue were reported at a higher incidence with increasing dose.

The discontinuation rate due to adverse reactions was 3.5 %, 3.4 % and 4.0 % for patients randomized to brivaracetam at respectively the dose of 50 mg/day, 100 mg/day and 200 mg/day and 1.7% for patients randomized to placebo. The adverse reactions most frequently resulting in discontinuation of brivaracetam therapy were dizziness (0.8 %) and convulsion (0.8 %).

### Tabulated list of adverse reactions

In the table below, adverse reactions, which were identified based on review of the three placebo-controlled, fixed-dose studies safety database in subjects  $\geq 16$  years of age and from post-marketing experience, are listed by System Organ Class and frequency. The frequencies are defined as follows: very common ( $\geq 1/10$ ), common ( $\geq 1/100$  to  $< 1/10$ ), uncommon ( $\geq 1/1,000$  to  $< 1/100$ ) and not known (frequency cannot be estimated from available data). Within each frequency grouping, undesirable effects are presented in order of decreasing seriousness.

<b>System organ class</b>	<b>Frequency</b>	<b>Adverse reactions</b>
<b>Infections and infestations</b>	Common	Influenza
<b>Blood and lymphatic system disorders</b>	Uncommon	Neutropenia
<b>Immune system disorders</b>	Uncommon	Type I hypersensitivity
<b>Metabolism and nutrition disorders</b>	Common	Decreased appetite
<b>Psychiatric disorders</b>	Common	Depression, anxiety, insomnia, irritability
	Uncommon	Suicidal ideation, psychotic disorder, aggression, agitation
<b>Nervous system disorders</b>	Very common	Dizziness, somnolence
	Common	Convulsion, vertigo
<b>Respiratory, thoracic and mediastinal disorders</b>	Common	Upper respiratory tract infections, cough
<b>Gastrointestinal disorders</b>	Common	Nausea, vomiting, constipation

System organ class	Frequency	Adverse reactions
Skin and subcutaneous tissue disorders	Not known	Stevens-Johnson syndrome <sup>(1)</sup>
General disorders and administration site conditions	Common	Fatigue

<sup>(1)</sup> Adverse reactions reported in post marketing experience.

#### Description of selected adverse reactions

Neutropenia has been reported in 0.5 % (6/1,099) brivaracetam patients and 0 % (0/459) placebo patients. Four of these subjects had decreased neutrophil counts at baseline, and experienced additional decrease in neutrophil counts after initiation of brivaracetam treatment. None of the 6 cases of neutropenia were severe, required any specific treatment or led to discontinuation of brivaracetam and none had associated infections.

Suicidal ideation has been reported in 0.3 % (3/1,099) brivaracetam patients and 0.7 % (3/459) placebo patients. In the short-term clinical studies of brivaracetam in epilepsy patients, there were no cases of completed suicide and suicide attempt, however both have been reported in open-label extension studies (see section 4.4).

Reactions suggestive of immediate (Type I) hypersensitivity have been reported in a small number of brivaracetam patients (9/3022) during clinical development.

#### Paediatric population

The safety profile of brivaracetam observed in children from 1 month of age was consistent with the safety profile observed in adults. In the open label, uncontrolled, long-term studies suicidal ideation was reported in 4.7 % of paediatric patients (assessed from 6 years onwards, more common in adolescents) compared with 2.4 % of adults and behavioural disorders were reported in 24.8 % of paediatric patients compared with 15.1 % of adults. The majority of events were mild or moderate in intensity, were non-serious, and did not lead to discontinuation of study drug. An additional adverse reaction reported in children was psychomotor hyperactivity (4.7 %).

No specific pattern of adverse event (AE) was identified in children from 1 month to < 4 years of age when compared to older paediatric age groups. No significant safety information was identified indicating the increasing incidence of a particular AE in this age group. As data available in children younger than 2 years of age is limited, brivaracetam is not indicated in this age range. Limited clinical data are available in neonates.

#### Elderly

Of the 130 elderly subjects enrolled in the brivaracetam phase 2/3 development program (44 with epilepsy), 100 were 65-74 years of age and 30 were 75-84 years of age. The safety profile in elderly patients appears to be similar to that observed in younger adult patients.

#### 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

### Symptoms

There is limited clinical experience with brivaracetam overdose in humans. Somnolence and dizziness have been reported in a healthy subject taking a single dose of 1,400 mg of brivaracetam.

The following adverse reactions were reported with brivaracetam overdose: nausea, vertigo, balance disorder, anxiety, fatigue, irritability, aggression, insomnia, depression, and suicidal ideation in the post-marketing experience. In general, the adverse reactions associated with brivaracetam overdose were consistent with the known adverse reactions.

### Management of overdose

There is no specific antidote for overdose with brivaracetam. Treatment of an overdose should include general supportive measures. Since less than 10 % of brivaracetam is excreted in urine, haemodialysis is not expected to significantly enhance brivaracetam clearance (see section 5.2).

## 5. PHARMACOLOGICAL PROPERTIES

### 5.1 Pharmacodynamic properties

Pharmacotherapeutic group: antiepileptics, other antiepileptics, ATC code: N03AX23

### Mechanism of action

Brivaracetam displays a high and selective affinity for synaptic vesicle protein 2A (SV2A), a transmembrane glycoprotein found at presynaptic level in neurons and in endocrine cells. Although the exact role of this protein remains to be elucidated it has been shown to modulate exocytosis of neurotransmitters. Binding to SV2A is believed to be the primary mechanism for brivaracetam anticonvulsant activity.

### Clinical efficacy and safety

The efficacy of brivaracetam for the adjunctive therapy of partial onset seizures (POS) was established in 3 randomized, double-blind, placebo-controlled, fixed-dose, multi-center clinical studies in subjects 16 years of age and older. The daily dose of brivaracetam ranged from 5 to 200 mg/day across these studies. All studies had an 8-week baseline period followed by a 12-week treatment period with no up-titration. 1,558 patients received study drug of which 1,099 received brivaracetam. Study enrollment criteria required that patients have uncontrolled POS despite treatment with either 1 or 2 concomitant AEDs. Patients were required to have at least 8 POS during the baseline period. The primary endpoints in the phase 3 studies were the percent reduction in POS frequency over placebo and the 50 % responder rate based on 50 % reduction in POS frequency from baseline.

The most commonly taken AEDs at the time of study entry were carbamazepine (40.6 %), lamotrigine (25.2 %), valproate (20.5 %), oxcarbazepine (16.0 %), topiramate (13.5 %), phenytoin (10.2 %) and levetiracetam (9.8 %). The median baseline seizure frequency across the 3 studies was 9 seizures per 28 days. Patients had a mean duration of epilepsy of approximately 23 years.

The efficacy outcomes are summarized in Table 2. Overall, brivaracetam was efficacious for the adjunctive treatment of partial onset seizures in patients 16 years of age and older between 50 mg/day and 200 mg/day.

Table 2: Key Efficacy Outcomes for Partial Onset Seizure Frequency per 28 Days

Study	Placebo	Brivaracetam		
		* Statistically significant (p-value)		
		50 mg/day	100 mg/day	200 mg/day
<b>Study N01253<sup>(1)</sup></b>				
	n= 96	n= 101		
50 % Responder rate	16.7	32.7* (p=0.008)	~	~
Percent reduction over placebo (%)	NA	22.0* (p=0.004)	~	~
<b>Study N01252<sup>(1)</sup></b>				
	n = 100	n = 99	n = 100	
50 % Responder rate	20.0	27.3 (p=0.372)	36.0 <sup>(2)</sup> (p=0.023)	~
Percent reduction over placebo (%)	NA	9.2 (p=0.274)	20.5 <sup>(2)</sup> (p=0.010)	~
<b>Study N01358</b>				
	n = 259		n = 252	n = 249
50% Responder rate	21.6	~	38.9* (p<0.001)	37.8* (p<0.001)
Percent reduction over placebo (%)	NA	~	22.8* (p<0.001)	23.2* (p<0.001)

n = randomised patients who received at least 1 dose of study medication

~ Dose not studied

\* Statistically significant

<sup>(1)</sup> Approximately 20 % of the patients were on concomitant levetiracetam

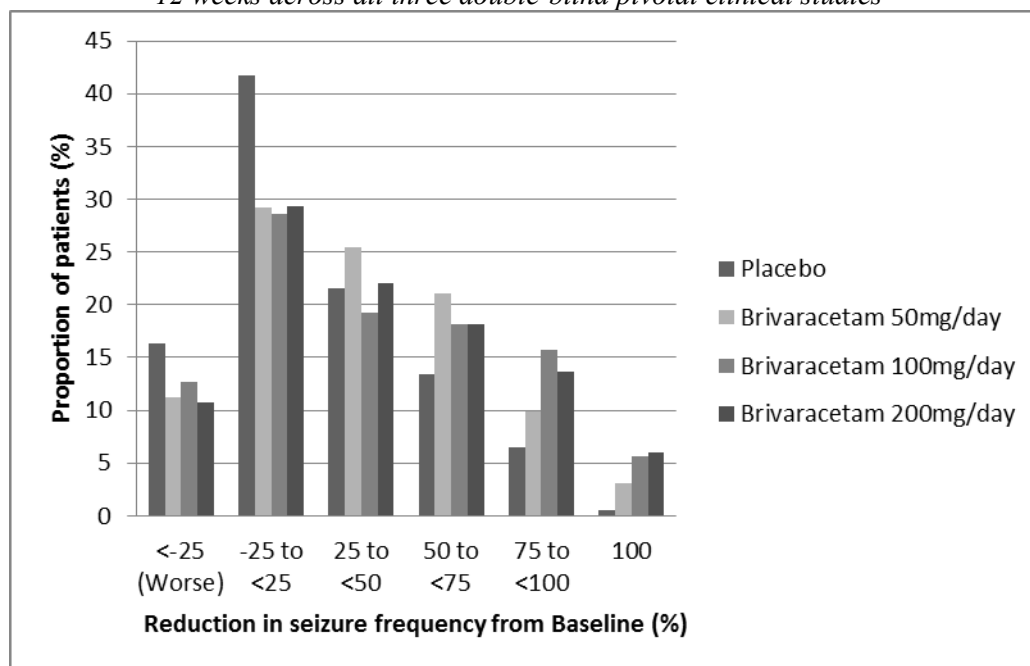
<sup>(2)</sup> The primary outcome for N01252 did not achieve statistical significance based on the sequential testing procedure. The 100 mg/day dose was nominally significant.

In clinical studies, a reduction in seizure frequency over placebo was higher with the dose of 100 mg/day than with 50 mg/day. Apart from dose-dependent increases in incidences of somnolence and fatigue, brivaracetam 50 mg/day and 100 mg/day had a similar safety profile including CNS-related AEs and with long-term use.

Figure 1 shows the percentage of patients (excluding patients with concomitant levetiracetam) by category of reduction from baseline in POS frequency per 28 days in all 3 studies. Patients with more than a 25 % increase in POS are shown at left as “worse”. Patients with an improvement in percent reduction in baseline POS frequency are shown in the 4 right-most categories. The percentages of patients with at least a 50 % reduction in seizure frequency were 20.3 %, 34.2 %, 39.5 %, and 37.8 % for placebo, 50 mg/day, 100 mg/day, and 200 mg/day, respectively.



Figure 1: Proportion of patients by category of seizure response for brivaracetam and placebo over 12 weeks across all three double-blind pivotal clinical studies



In a pooled analysis of the three pivotal clinical studies, no differences in efficacy (measured as 50 % responder rate) was observed within the dose range of 50 mg/day to 200 mg/day when brivaracetam is combined with inducing or non-inducing AEDs. In clinical studies 2.5 % (4/161), 5.1 % (17/332) and 4.0% (10/249) of the patients on brivaracetam 50 mg/day, 100 mg/day and 200 mg/day respectively became seizure free during the 12-week treatment period compared with 0.5 % (2/418) on placebo.

Improvement in the median percent reduction in seizure frequency per 28 days has been observed in patients with type IC seizure (secondary generalized tonic-clonic seizures) at baseline treated with brivaracetam (66.6 % (n=62), 61.2 % (n=100) and 82.1 % (n=75) of the patients on brivaracetam 50 mg/day, 100 mg/day and 200 mg/day respectively as compared to placebo 33.3 % (n=115)).

The efficacy of brivaracetam in monotherapy has not been established. Brivaracetam is not recommended for use in monotherapy.

#### Treatment with levetiracetam

In two phase 3 randomised placebo-controlled clinical studies, levetiracetam was administered as concomitant AED in about 20 % of the patients. Although the number of subjects is limited, there was no observed benefit of brivaracetam versus placebo in patients taking levetiracetam concurrently which may reflect competition at the SV2A binding site. No additional safety or tolerability concerns were observed.

In a third study, a pre-specified analysis demonstrated efficacy over placebo for 100 mg/day and 200 mg/day in patients with prior exposure to levetiracetam. The lower efficacy observed in these patients compared to the levetiracetam-naïve patients was likely due to the higher number of prior AEDs used and higher baseline seizure frequency.

#### *Elderly (65 years of age and above)*

The three pivotal double-blind placebo-controlled clinical studies included 38 elderly patients aged between 65 and 80 years. Although data are limited, the efficacy was comparable to younger subjects.

#### *Open label extension studies*

Across all studies, 81.7 % of the patients who completed randomized studies were enrolled in the long-term open-label extension studies. From entry into the randomized studies, 5.3 % of the subjects

exposed to brivaracetam for 6 months (n=1,500) were seizure free compared to 4.6 % and 3.7 % for subjects exposed for 12 months (n=1,188) and 24 months (n=847), respectively. However, as a high proportion of subjects (26%) discontinued from the open-label studies due to lack of efficacy, a selection bias may have occurred, as the subjects who stayed in the study responded better than those who have terminated prematurely.

In patients who were followed up in the open-label extension studies for up to 8 years, the safety profile was similar to that observed in the short-term, placebo-controlled clinical studies.

### Paediatric population

In children aged 2 years and older, partial onset seizures have a similar pathophysiology to those in adolescents and adults. Experience with epilepsy medicines suggests that the results of efficacy studies performed in adults can be extrapolated to children down to the age of 2 years provided the paediatric dose adaptations are established and safety has been demonstrated (see sections 5.2 and 4.8). Doses in patients from 2 years of age were defined by weight-based dose adaptations which have been established to achieve similar plasma concentrations to the ones observed in adults taking efficacious doses (section 5.2).

A long-term, uncontrolled, open-label safety study included children (from 1 month of age to less than 16 years) who continued treatment after completing the PK study (see section 5.2), children who continued treatment after completing the i.v. (intravenous) safety study and children directly enrolled into the safety study. Children who directly enrolled received a brivaracetam starting dose of 1 mg/kg/day and depending on response and tolerability, the dose was increased up to 5 mg/kg/day by doubling the dose at weekly intervals. No child received a dose greater than 200 mg/day. For children weighing 50 kg or greater the brivaracetam starting dose was 50 mg/day and depending on response and tolerability, the dose was increased up to a maximum of 200 mg/day by weekly increments of 50 mg/day.

From the pooled open-label safety and PK studies in adjunctive therapy, 186 children with POS in the age range of 1 month < 16 years of age have received brivaracetam, of whom 149 have been treated for  $\geq 3$  months, 138 for  $\geq 6$  months, 123 for  $\geq 12$  months, 107 for  $\geq 24$  months, and 90 for  $\geq 36$  months.

The European Medicines Agency has deferred the obligation to submit the results of studies with brivaracetam in one or more subsets of the paediatric population in epilepsy with partial onset seizures (see section 4.2 for information on paediatric use).

## **5.2 Pharmacokinetic properties**

Brivaracetam film-coated tablets, oral solution and solution for intravenous injection show the same AUC, while the maximum plasma concentration is slightly higher after intravenous administration. Brivaracetam exhibits linear and time-independent pharmacokinetics with low intra- and inter-subject variability, and features complete absorption, very low protein binding, renal excretion following extensive biotransformation, and pharmacologically inactive metabolites.

### Absorption

Brivaracetam is rapidly and completely absorbed after oral administration and the absolute bioavailability is approximately 100 %. The median  $t_{\max}$  for tablets taken without food is 1 hour ( $t_{\max}$  range is 0.25 to 3 h).

Coadministration with a high-fat meal slowed down the absorption rate (median  $t_{\max}$  3 h) and decreased the maximum plasma concentration (37 % lower) of brivaracetam, while the extent of absorption remained unchanged.

### Distribution

Brivaracetam is weakly bound ( $\leq 20\%$ ) to plasma proteins. The volume of distribution is 0.5 L/kg, a value close to that of the total body water.

Due to its lipophilicity (Log P) brivaracetam has high cell membrane permeability.

### Biotransformation

Brivaracetam is primarily metabolized by hydrolysis of the amide moiety to form the corresponding carboxylic acid (approximately 60 % the elimination), and secondarily by hydroxylation on the propyl side chain (approximately 30 % the elimination). The hydrolysis of the amide moiety leading to the carboxylic acid metabolite (34 % of the dose in urine) is supported by hepatic and extra-hepatic amidase. *In vitro*, the hydroxylation of brivaracetam is mediated primarily by CYP2C19. Both metabolites, are further metabolised forming a common hydroxylated acid formed predominantly by hydroxylation of the propyl side chain on the carboxylic acid metabolite (mainly by CYP2C9). *In vivo*, in human subjects possessing ineffective mutations of CYP2C19, production of the hydroxy metabolite is decreased 10-fold while brivaracetam itself is increased by 22 % or 42 % in individuals with one or both mutated alleles. The three metabolites are not pharmacologically active.

### Elimination

Brivaracetam is eliminated primarily by metabolism and by excretion in the urine. More than 95 % of the dose, including metabolites, is excreted in the urine within 72 hours after intake. Less than 1 % of the dose is excreted in faeces and less than 10 % of brivaracetam is excreted unchanged in urine. The terminal plasma half-life ( $t_{1/2}$ ) is approximately 9 hours. The total plasma clearance in patients was estimated to 3.6 L/h.

### Linearity

Pharmacokinetics is dose-proportional from 10 to at least 600 mg.

### Interactions with medicinal products

Brivaracetam is cleared by multiple pathways including renal excretion, non-CYP-mediated hydrolysis and CYP-mediated oxidations. *In vitro*, brivaracetam is not a substrate of human P-glycoprotein (P-gp), multidrug resistance proteins (MRP) 1 and 2, and likely not organic anion transporter polypeptide 1B1 (OATP1B1) and OATP1B3.

*In vitro* assays showed that brivaracetam disposition should not be significantly affected by CYP (eg. CYP1A, CYP2C8, CYP2C9, CYP2D6 and CYP3A4) inhibitors.

*In vitro*, brivaracetam was not an inhibitor of the CYP1A2, CYP2A6, CYP2B6, CYP2C8, CYP2C9, CYP2D6, CYP3A4, or the transporters P-gp, BCRP, BSEP MRP2, MATE-K, MATE-1, OATP1B1, OATP1B3, OAT1 and OCT1 at clinically relevant concentrations. *In vitro*, brivaracetam did not induce CYP1A2.

### Pharmacokinetics in special patient groups

#### *Elderly (65 years of age and above)*

In a study in elderly subjects (65 to 79 years old; with creatinine clearance 53 to 98 ml/min/1.73 m<sup>2</sup>) receiving brivaracetam 400 mg/day in bid administration, the plasma half-life of brivaracetam was 7.9 hours and 9.3 hours in the 65 to 75 and >75 years groups, respectively. The steady-state plasma clearance of brivaracetam was similar (0.76 ml/min/kg) to young healthy male subjects (0.83 ml/min/kg). (see section 4.2).

#### *Renal impairment*

A study in subjects with severe renal impairment (creatinine clearance < 30 ml/min/1.73 m<sup>2</sup> and not requiring dialysis) revealed that the plasma AUC of brivaracetam was moderately increased (+21 %) relative to healthy controls, while the AUC of the acid, hydroxy and hydroxyacid metabolites were increased 3-, 4-, and 21-fold, respectively. The renal clearance of these non active metabolites was decreased 10-fold. The hydroxyacid metabolite did not reveal any safety concerns in non clinical studies. Brivaracetam has not been studied in patients undergoing hemodialysis (see section 4.2).

#### *Hepatic impairment*

A pharmacokinetic study in subjects with hepatic cirrhosis (Child-Pugh classes A, B, and C) showed similar increases in exposure to brivaracetam irrespective of disease severity (50 %, 57 % and 59 %), relative to matched healthy controls. (see section 4.2).

#### *Body weight*

A 40 % decrease in steady-state plasma concentration has been estimated across a body weight range from 46 kg to 115 kg. However, this is not considered to be a clinically relevant difference.

#### *Gender*

There are no clinically relevant differences in the pharmacokinetics of brivaracetam by gender.

#### *Race*

The pharmacokinetics of brivaracetam was not significantly affected by race (Caucasian, , Asian) in a population pharmacokinetic modeling from epilepsy patients. The number of patients with other ethnic background was limited.

#### Pharmacokinetic/pharmacodynamics relationship

The EC<sub>50</sub> (brivaracetam plasma concentration corresponding to 50 % of the maximum effect) was estimated to be 0.57 mg/L. This plasma concentration is slightly above the median exposure obtained after brivaracetam doses of 50 mg/day. Further seizure frequency reduction is obtained by increasing the dose to 100 mg/day and reaches a plateau at 200 mg/day.

#### Paediatric population

In a pharmacokinetic study with a 3-week evaluation period and weekly fixed 3-step up-titration using the brivaracetam oral solution, 99 subjects aged 1 month to < 16 years were evaluated. Brivaracetam was administered at weekly increasing doses of approximately 1 mg/kg/day, 2 mg/kg/day, and 4 mg/kg/day. All doses were adjusted by body weight, and did not exceed a maximum of 50 mg/day, 100 mg/day, and 200 mg/day. At the end of the evaluation period, subjects may have been eligible for entry into a long-term follow-up study continuing on their last received dose (see section 4.8). Plasma concentrations were shown to be dose-proportional in all age groups. Population pharmacokinetics modeling was performed based on sparse plasma concentration data collected in the 3-week PK study and the ongoing long-term follow-up study. 232 paediatric patients with epilepsy, aged 2 months to 17 years, were included in the analysis. The analysis indicated that doses of 5.0 (body weights 10-20 kg) and 4.0 mg/kg/day (body weights 20-50 kg) provide the same steady-state average plasma concentration as in adults receiving 200 mg/day. The estimated plasma clearance was 0.96 L/h, 1.61 L/h, 2.18 L/h and 3.19 L/h for children weighing 10 kg, 20 kg, 30 kg and 50 kg, respectively. In comparison, plasma clearance was estimated at 3.58 L/h in adult patients (70 kg body weight). Currently, no clinical data are available in neonates.

### **5.3 Preclinical safety data**

In safety pharmacology studies, the predominant effects were CNS related (mainly transient CNS depression and decreased spontaneous locomotor activity) seen at multiples (greater than 50 fold) of the pharmacologically active dose of brivaracetam, 2 mg/kg. Learning and memory function were not affected.

Findings not observed in clinical studies, but seen in the repeated-dose toxicology dog studies at exposure similar to the clinical plasma AUC, were hepatotoxic effects (mainly porphyria). However, toxicological data accumulated on brivaracetam and on a structurally-related compound indicate that the dog liver changes have developed through mechanisms not relevant for humans. No adverse liver changes were seen in rats and monkeys following chronic administration of brivaracetam at 5- and 42-fold the clinical AUC exposure. In monkeys, CNS signs (prostrate, loss of balance, clumsy movements) occurred at 64 fold the clinical  $C_{max}$ , these effects being less apparent over time.

Genotoxicity studies have not detected any mutagenic or clastogenic activity. Carcinogenicity studies did not indicate any oncogenic potential in rats, whereas increased incidences of hepatocellular tumors in male mice are considered to result of a non-genotoxic, mode of action linked to a phenobarbitone-like liver enzyme induction, which is a known rodent specific phenomenon.

Brivaracetam did not affect male or female fertility and has demonstrated no teratogenic potential in either rat or rabbit. Embryotoxicity was observed in rabbits at a maternal toxic dose of brivaracetam with an exposure level 8-fold the clinical AUC exposure at the maximum recommended dose. In rats, brivaracetam was shown to readily cross the placenta and to be excreted in milk of lactating rats with concentrations similar to maternal plasma levels.

Brivaracetam did not show any dependence potential in rats.

#### Juvenile animals studies

In juvenile rats, brivaracetam exposure levels 6- to 15-fold the clinical AUC exposure at the maximum recommended dose induced developmental adverse effects (i.e. mortality, clinical signs, decreased body weight and lower brain weight). There were no adverse effects on CNS function, neuropathological and brain histopathological examination. In juvenile dogs, the brivaracetam-induced changes at the exposure level 6- fold the clinical AUC were similar to those observed in adult animals. There were no adverse effects in any of the standard developmental or maturation endpoints.

## **6. PHARMACEUTICAL PARTICULARS**

### **6.1 List of excipients**

Sodium citrate  
Citric acid anhydrous (for pH-adjustment)  
Methyl parahydroxybenzoate (E218)  
Carmellose sodium  
Sucralose  
Sorbitol liquid (E420)  
Glycerol (E422)  
Raspberry flavour (propylene glycol (E1520) 90 % - 98 %)  
Purified water

### **6.2 Incompatibilities**

Not applicable

### **6.3 Shelf life**

4 years.  
After first opening: 8 months

### **6.4 Special precautions for storage**

This medicinal product does not require any special storage conditions.

## **6.5 Nature and contents of container**

300 ml amber glass bottle (type III) with a white child resistant closure (polypropylene) in a box also containing a 5 ml (blue graduation marks) and a 10 ml (black graduation marks) graduated oral dosing syringe (polypropylene, polyethylene) and an adaptor for the syringe (polyethylene).

## **6.6 Special precautions for disposal**

No special requirements.

Any unused medicinal product, neat or diluted, or waste material should be disposed of in accordance with local requirements.

## **7. MARKETING AUTHORISATION HOLDER**

UCB Pharma S.A.  
Allée de la Recherche 60  
B-1070 Bruxelles  
Belgium

## **8. MARKETING AUTHORISATION NUMBER(S)**

EU/1/15/1073/021

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

Date of first authorisation: 14 January 2016  
Date of latest renewal: 9 October 2020

## **10. DATE OF REVISION OF THE TEXT**

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

## 1. NAME OF THE MEDICINAL PRODUCT

Briviact 10 mg/ml solution for injection/infusion

## 2. QUALITATIVE AND QUANTITATIVE COMPOSITION

Each ml contains 10mg brivaracetam

Each 5 ml vial contains 50 mg brivaracetam

Excipient(s) with known effect:

Each ml of solution for injection/infusion contains 3.8 mg sodium.

For the full list of excipients, see section 6.1.

## 3. PHARMACEUTICAL FORM

Solution for injection/infusion (injection/infusion)

Clear, colourless, solution.

## 4. CLINICAL PARTICULARS

### 4.1 Therapeutic indications

Briviact is indicated as adjunctive therapy in the treatment of partial onset seizures with or without secondary generalisation in adults, adolescents and children from 2 years of age with epilepsy.

### 4.2 Posology and method of administration

#### Posology

Brivaracetam solution for injection/infusion is an alternative route of administration for patients when oral administration is temporarily not feasible. There is no experience with twice daily intravenous administration of brivaracetam for a period longer than 4 days.

The recommended posology for adults, adolescents and children from 2 years of age is summarised in the following table. The dose should be administered in two equally divided doses, approximately 12 hours apart.

Recommended starting dose	Recommended maintenance dose	Therapeutic dose range*
<b><u>Adolescents and children weighing 50 kg or more, and adults</u></b>		
50 mg/day (or 100 mg/day)**	100 mg/day	50 - 200 mg/day
<b><u>Adolescents and children weighing from 20 kg to less than 50 kg</u></b>		
1 mg/kg/day (up to 2 mg/kg/day)**	2 mg/kg/day	1 – 4 mg/kg/day
<b><u>Children weighing from 10 kg to less than 20 kg</u></b>		
1 mg/kg/day (up to 2.5 mg/kg/day)**	2.5 mg/kg/day	1 – 5 mg/kg/day

\* Based on individual patient response, the dose may be adjusted between this effective dose range.

\*\* Based on physician's assessment of need for seizure control

### *Adults*

Brivaracetam may be initiated with either intravenous or oral administration. When converting from oral to intravenous administration or *vice versa*, the total daily dose and frequency of administration should be maintained.

The recommended starting dose is either 50 mg/day or 100 mg/day based on physician's assessment of required seizure reduction versus potential side effects. Based on individual patient response and tolerability, the dose may be adjusted in the effective dose range of 50 mg/day to 200 mg/day.

### *Adolescents and children weighing 50 kg or more*

The recommended starting dose is 50 mg/day. Brivaracetam may also be initiated at 100 mg/day based on physician's assessment of need for seizure control. The recommended maintenance dose is 100 mg/day. Based on individual patient response, the dose may be adjusted in the effective dose range of 50 mg/day to 200 mg/day.

### *Adolescents and children weighing from 20 kg to less than 50 kg*

The recommended starting dose is 1 mg/kg/day. Brivaracetam may also be initiated at doses up to 2 mg/kg/day based on physician's assessment of need for seizure control. The recommended maintenance dose is 2 mg/kg/day. Based on individual patient response, the dose may be adjusted in the effective dose range of 1 mg/kg/day to 4 mg/kg/day.

### *Children weighing from 10 kg to less than 20 kg*

The recommended starting dose is 1 mg/kg/day. Brivaracetam may also be initiated at doses up to 2.5 mg/kg/day based on physician's assessment of need for seizure control. The recommended maintenance dose is 2.5 mg/kg/day. Based on individual patient response, the dose may be adjusted in the effective dose range of 1 mg/kg/day to 5 mg/kg/day.

### *Missed doses*

If patients missed one dose or more, it is recommended that they take a single dose as soon as they remember and take the following dose at the usual morning or evening time. This may avoid the brivaracetam plasma concentration falling below the efficacy level and prevent breakthrough seizures from occurring.

### *Discontinuation*

For patients from 16 years of age, if brivaracetam has to be discontinued, it is recommended that the dose is reduced gradually by 50 mg/day on a weekly basis.

For patients below the age of 16 years, if brivaracetam has to be discontinued, it is recommended that the dose is reduced by a maximum of half the dose every week until a dose of 1 mg/kg/day (for patients with a body weight less than 50 kg) or 50 mg/day (for patients with body weight of 50 kg or more) is reached.

After 1 week of treatment at 50 mg/day, a final week of treatment at the dose of 20 mg/day is recommended.

### Special populations

#### *Elderly (65 years of age and above)*

No dose adjustment is needed in elderly patients (see section 5.2).

The clinical experience in patients  $\geq 65$  years is limited.

#### *Renal impairment*

No dose adjustment is needed in patients with impaired renal function (see section 5.2). Brivaracetam is not recommended in end-stage renal disease patients undergoing dialysis due to lack of data.

Based on data in adults, no dose adjustment is necessary in paediatric patients with impaired renal function. No clinical data are available in paediatric patients with renal impairment.

#### *Hepatic impairment*

Exposure to brivaracetam was increased in adult patients with chronic liver disease.



In patients with hepatic impairment, the following adjusted doses, administered in 2 divided doses, approximately 12 hours apart, are recommended for all stages of hepatic impairment (see sections 4.4 and 5.2). No clinical data are available in paediatric patients with hepatic impairment.

Age and body weight	Recommended starting dose	Recommended maximum daily dose
Adolescents and children weighing 50 kg or more, and adults	50 mg/day	150 mg/day
Adolescents and children weighing from 20 kg to less than 50 kg	1 mg/kg/day	3 mg/kg/day
Children weighing from 10 kg to less than 20 kg	1 mg/kg/day	4 mg/kg/day

#### *Paediatric patients less than 2 years of age*

The efficacy of brivaracetam in paediatric patients aged less than 2 years has not yet been established. Currently available data are described in section 4.8, 5.1, and 5.2 but no recommendation on a posology can be made.

#### Method of administration

- Intravenous bolus: brivaracetam may be administered as an intravenous bolus without dilution.
- Intravenous infusion: brivaracetam may be diluted in a compatible diluent and administered as a 15-minute intravenous infusion (see section 6.6). This medicinal product must not be mixed with other medicinal products.

Brivaracetam bolus injection or intravenous infusion has not been studied in acute conditions; e.g. status epilepticus and is therefore not recommended for such conditions.

### **4.3 Contraindications**

Hypersensitivity to the active substance or other pyrrolidone derivatives or to any of the excipients listed in section 6.1.

### **4.4 Special warnings and precautions for use**

#### Suicidal ideation and behaviour

Suicidal ideation and behaviour have been reported in patients treated with anti-epileptic drugs (AEDs), including brivaracetam, in several indications. A meta-analysis of randomized placebo-controlled clinical studies of AEDs has also shown a small increased risk of suicidal ideation and behaviour. The mechanism of this risk is not known and the available data do not exclude the possibility of an increased risk for brivaracetam.

Patients should be monitored for signs of suicidal ideation and behaviours and appropriate treatment should be considered. Patients (and caregivers of patients) should be advised to seek medical advice should any signs of suicidal ideation or behaviour emerge. See also section 4.8, paediatric data.

#### Hepatic impairment

There are limited clinical data on the use of brivaracetam in patients with pre-existing hepatic impairment. Dose adjustments are recommended for patients with hepatic impairment (see section 4.2).

### Severe cutaneous adverse reactions (SCARs)

Severe cutaneous adverse reactions (SCARs) including Stevens-Johnson syndrome (SJS), which can be life-threatening or fatal, have been reported in association with brivaracetam treatment. At the time of the prescription patients should be advised of the signs and symptoms and monitored closely for skin reactions. If signs and symptoms suggestive of these reactions appear, brivaracetam should be withdrawn immediately and an alternative treatment should be considered.

### Excipients

This medicinal product contains 19.1 mg sodium per vial, equivalent to 1 % of the WHO recommended maximum daily intake of 2 g sodium for an adult.

## **4.5 Interaction with other medicinal products and other forms of interaction**

Formal interaction studies have only been performed in adults.

### Pharmacodynamic interactions

#### *Concomitant treatment with levetiracetam*

In the clinical studies, although the numbers were limited, there was no observed benefit of brivaracetam versus placebo in patients taking levetiracetam concurrently. No additional safety or tolerability concern was observed (see section 5.1).

#### *Interaction with alcohol*

In a pharmacokinetic and pharmacodynamic interaction study between brivaracetam 200 mg single dose and ethanol 0.6 g/L continuous infusion in healthy subjects, there was no pharmacokinetic interaction, but brivaracetam approximately doubled the effect of alcohol on psychomotor function, attention and memory. Intake of brivaracetam with alcohol is not recommended.

### Pharmacokinetic interactions

#### *Effects of other medicinal products on the pharmacokinetics of brivaracetam*

*In vitro* data suggest that brivaracetam has a low interaction potential. The main disposition pathway of brivaracetam is by CYP-independent hydrolysis. A second disposition pathway involves hydroxylation mediated by CYP2C19 (see section 5.2).

Brivaracetam plasma concentrations may increase when coadministered with CYP2C19 strong inhibitors (e.g. fluconazole, fluvoxamine), but the risk of a clinically relevant CYP2C19-mediated interaction is considered to be low. Limited clinical data are available implying that coadministration of cannabidiol may increase the plasma exposure of brivaracetam, possibly through CYP2C19 inhibition, but the clinical relevance is uncertain.

#### *Rifampicin*

In healthy subjects, coadministration with the strong enzyme inducer rifampicin (600 mg/day for 5 days), decreased brivaracetam area under the plasma concentration curve (AUC) by 45 %. Prescribers should consider adjusting the brivaracetam dose in patients starting or ending treatment with rifampicin.

#### *Strong enzyme inducing AEDs*

Brivaracetam plasma concentrations are decreased when coadministered with strong enzyme inducing AEDs (carbamazepine, phenobarbital, phenytoin) but no dose adjustment is required (see table 1).

#### *Other enzyme inducers*

Other strong enzyme inducers (such as St John's wort (*Hypericum perforatum*)) may also decrease the systemic exposure of brivaracetam. Therefore, starting or ending treatment with St John's wort should be done with caution.

### Effects of brivaracetam on other medicinal products

Brivaracetam given 50 or 150 mg/day did not affect the AUC of midazolam (metabolised by CYP3A4). The risk of clinically relevant CYP3A4 interactions is considered to be low.

*In vitro* studies have shown that brivaracetam exhibits little or no inhibition of CYP450 isoforms except for CYP2C19. Brivaracetam may increase plasma concentrations of medicinal products metabolised by CYP2C19 (e.g. lansoprazole, omeprazole, diazepam). When tested *in vitro* brivaracetam did not induce CYP1A1/2 but induced CYP3A4 and CYP2B6. No CYP3A4 induction was found *in vivo* (see midazolam above). CYP2B6 induction has not been investigated *in vivo* and brivaracetam may decrease plasma concentrations of medicinal products metabolised by CYP2B6 (e.g. efavirenz). *In vitro*, interaction studies to determine the potential inhibitory effects on transporters concluded that there were no clinically relevant effects, except for OAT3. *In vitro*, brivaracetam inhibits OAT3 with a half maximal inhibitory concentration 42-fold higher than the  $C_{max}$  at the highest clinical dose. Brivaracetam 200mg/day may increase plasma concentrations of medicinal products transported by OAT3.

### Antiepileptic drugs

Potential interactions between brivaracetam (50 mg/day to 200 mg/day) and other AEDs were investigated in a pooled analysis of plasma drug concentrations from all phase 2-3 studies in a population pharmacokinetic analysis of placebo-controlled phase 2-3 clinical studies, and in dedicated drug-drug interaction studies (for the following AEDs: carbamazepine, lamotrigine, phenytoin and topiramate). The effect of the interactions on the plasma concentration is summarised in table 1 (increase is indicated as “↑” and decrease as “↓”, area under the plasma concentration versus time curve as “AUC”, maximum observed concentration as  $C_{max}$ ).

Table 1: Pharmacokinetic interactions between brivaracetam and other AEDs

AED coadministered	Influence of AED on brivaracetam plasma concentration	Influence of brivaracetam on AED plasma concentration
Carbamazepine	AUC 29 % ↓ $C_{max}$ 13 % ↓ No dose adjustment required	Carbamazepine - None Carbamazepine-epoxide ↑ (See below) No dose adjustment required.
Clobazam	No data available	None
Clonazepam	No data available	None
Lacosamide	No data available	None
Lamotrigine	None	None
Levetiracetam	None	None
Oxcarbazepine	None	None (monohydroxy derivative, MHD)
Phenobarbital	AUC 19 % ↓ No dose adjustment required	None
Phenytoin	AUC 21 % ↓ No dose adjustment required	None <sup>a</sup> AUC 20% ↑ <sup>a</sup> $C_{max}$ 20% ↑
Pregabalin	No data available	None
Topiramate	None	None
Valproic acid	None	None
Zonisamide	No data available	None

<sup>a</sup> based on a study involving the administration of a supratherapeutic dose of 400 mg/day brivaracetam

### Carbamazepine

Brivaracetam is a moderate reversible inhibitor of epoxide hydrolase resulting in an increased concentration of carbamazepine epoxide, an active metabolite of carbamazepine. In controlled clinical studies, the carbamazepine epoxide plasma concentration increased by a mean of 37 %, 62 % and 98 % with little variability at brivaracetam doses of 50 mg/day, 100 mg/day and 200 mg/day

respectively. No safety risks were observed. There was no additive effect of brivaracetam and valproate on the AUC of carbamazepine epoxide.

#### Oral contraceptives

Co-administration of brivaracetam (100 mg/day) with an oral contraceptive containing ethinylestradiol (0.03 mg) and levonorgestrel (0.15 mg) did not influence the pharmacokinetics of either substance. When brivaracetam was coadministered at a dose of 400 mg/day (twice the recommended maximum daily dose) with an oral contraceptive containing ethinylestradiol (0.03 mg) and levonorgestrel (0.15 mg), a reduction in oestrogen and progestin AUCs of 27 % and 23 %, respectively, was observed without impact on suppression of ovulation. There was generally no change in the concentration-time profiles of the endogenous markers estradiol, progesterone, luteinizing hormone (LH), follicle stimulating hormone (FSH), and sex hormone binding globulin (SHBG).

### **4.6 Fertility, pregnancy and lactation**

#### Women of childbearing potential

Physicians should discuss family planning and contraception with women of childbearing potential taking brivaracetam (see Pregnancy).

If a woman decides to become pregnant, the use of brivaracetam should be carefully re-evaluated.

#### Pregnancy

##### *Risk related to epilepsy and antiepileptic medicinal products in general*

For all anti-epileptic drugs, it has been shown that in the offspring of treated women with epilepsy, the prevalence of malformations is two to three times greater than the rate of approximately 3 % in the general population. In the treated population, an increase in malformations has been noted with polytherapy; however, the extent to which the treatment and/or the underlying condition is responsible has not been elucidated. Discontinuation of anti-epileptic treatments may result in exacerbation of the disease which could be harmful to the mother and the foetus.

##### *Risk related to brivaracetam*

There is a limited amount of data from the use of brivaracetam in pregnant women. There is no data on placental transfer in humans, but brivaracetam was shown to readily cross the placenta in rats (see section 5.3). The potential risk for humans is unknown. Animal studies did not detect any teratogenic potential of brivaracetam (see section 5.3).

In clinical studies, brivaracetam was used as adjunctive therapy and when it was used with carbamazepine, it induced a dose-related increase in the concentration of the active metabolite, carbamazepine-epoxide (see section 4.5). There is insufficient data to determine the clinical significance of this effect in pregnancy.

As a precautionary measure, brivaracetam should not be used during pregnancy unless clinically necessary i.e. (if the benefit to the mother clearly outweighs the potential risk to the foetus).

#### Breast-feeding

Brivaracetam is excreted in human breast milk. A decision should be made whether to discontinue breastfeeding or to discontinue brivaracetam, taking into account the benefit of the medicinal product to the mother. In case of co-administration of brivaracetam and carbamazepine, the amount of carbamazepine-epoxide excreted in breast milk could increase. There is insufficient data to determine the clinical significance.

## Fertility

No human data on the effect of brivaracetam on fertility are available. In rats, there was no effect on fertility with brivaracetam (see section 5.3).

## **4.7 Effects on ability to drive and use machines**

Brivaracetam has minor or moderate influence on the ability to drive and use machines.

Due to possible differences in individual sensitivity some patients might experience somnolence, dizziness, and other central nervous system (CNS) related symptoms. Patients should be advised not to drive a car or to operate other potentially hazardous machines until they are familiar with the effects of brivaracetam on their ability to perform such activities.

## **4.8 Undesirable effects**

### Summary of the safety profile

The most frequently reported adverse reactions (>10%) with brivaracetam treatment were: somnolence (14.3 %) and dizziness (11.0 %). They were usually mild to moderate in intensity. Somnolence and fatigue were reported at a higher incidence with increasing dose.

The discontinuation rate due to adverse reactions was 3.5 %, 3.4 % and 4.0 % for patients randomized to brivaracetam at respectively the dose of 50 mg/day, 100 mg/day and 200 mg/day and 1.7 % for patients randomized to placebo. The adverse reactions most frequently resulting in discontinuation of brivaracetam therapy were dizziness (0.8 %) and convulsion (0.8 %).

### Tabulated list of adverse reactions

In the table below, adverse reactions, which were identified based on review of the three placebo-controlled, fixed-dose studies safety database in subjects  $\geq 16$  years of age and from post-marketing experience, are listed by System Organ Class and frequency.

The frequencies are defined as follows: very common ( $\geq 1/10$ ), common ( $\geq 1/100$  to  $< 1/10$ ), uncommon ( $\geq 1/1,000$  to  $< 1/100$ ) and not known (frequency cannot be estimated from available data). Within each frequency grouping, undesirable effects are presented in order of decreasing seriousness.

<b>System organ class</b>	<b>Frequency</b>	<b>Adverse reactions</b>
<b>Infections and infestations</b>	Common	Influenza
<b>Blood and lymphatic system disorders</b>	Uncommon	Neutropenia
<b>Immune system disorders</b>	Uncommon	Type I hypersensitivity
<b>Metabolism and nutrition disorders</b>	Common	Decreased appetite
<b>Psychiatric disorders</b>	Common	Depression, anxiety, insomnia, irritability
	Uncommon	Suicidal ideation, psychotic disorder, aggression, agitation
<b>Nervous system disorders</b>	Very common	Dizziness, somnolence
	Common	Convulsion, vertigo
<b>Respiratory, thoracic and mediastinal disorders</b>	Common	Upper respiratory tract infections, cough
<b>Gastrointestinal disorders</b>	Common	Nausea, vomiting, constipation
<b>Skin and subcutaneous tissue disorders</b>	Not known	Stevens-Johnson syndrome <sup>(1)</sup>
<b>General disorders and administration site conditions</b>	Common	Fatigue

<sup>(1)</sup> Adverse reactions reported in post marketing experience.

#### Description of selected adverse reactions

Neutropenia has been reported in 0.5 % (6/1,099) brivaracetam patients and 0 % (0/459) placebo patients. Four of these subjects had decreased neutrophil counts at baseline, and experienced additional decrease in neutrophil counts after initiation of brivaracetam treatment. None of the 6 cases of neutropenia were severe, required any specific treatment or led to discontinuation of brivaracetam and none had associated infections.

Suicidal ideation has been reported in 0.3 % (3/1,099) brivaracetam patients and 0.7 % (3/459) placebo patients. In the short-term clinical studies of brivaracetam in epilepsy patients, there were no cases of completed suicide and suicide attempt, however both have been reported in open-label extension studies(see section 4.4).

Reactions suggestive of immediate (Type I) hypersensitivity have been reported in a small number of brivaracetam patients (9/3022) during clinical development.

Adverse reactions with intravenous administration generally appeared to be similar to those observed with oral administration. Intravenous administration was associated with infusion site pain in 2.8 % of the patients.

#### Paediatric population

The safety profile of brivaracetam observed in children from 1 month of age was consistent with the safety profile observed in adults. In the open label, uncontrolled, long-term studies suicidal ideation was reported in 4.7 % of paediatric patients (assessed from 6 years onwards, more common in adolescents) compared with 2.4 % of adults and behavioural disorders were reported in 24.8 % of paediatric patients compared with 15.1 % of adults. The majority of events were mild or moderate in intensity, were non-serious, and did not lead to discontinuation of study drug. An additional adverse reaction reported in children was psychomotor hyperactivity (4.7 %).

No specific pattern of adverse event (AE) was identified in children from 1-month to < 4-years of age when compared to older paediatric age groups. No significant safety information was identified indicating the increasing incidence of a particular AE in this age group. As data available in children younger than 2 years of age is limited, brivaracetam is not indicated in this age range. Limited clinical data are available in neonates.

### Elderly

Of the 130 elderly subjects enrolled in the brivaracetam phase 2/3 development program (44 with epilepsy), 100 were 65-74 years of age and 30 were 75-84 years of age. The safety profile in elderly patients appears to be similar to that observed in younger adult patients.

### 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**

### Symptoms

There is limited clinical experience with brivaracetam overdose in humans. Somnolence and dizziness have been reported in a healthy subject taking a single dose of 1,400 mg of brivaracetam.

The following adverse reactions were reported with brivaracetam overdose: nausea, vertigo, balance disorder, anxiety, fatigue, irritability, aggression, insomnia, depression, and suicidal ideation in the post-marketing experience. In general, the adverse reactions associated with brivaracetam overdose were consistent with the known adverse reactions.

### Management of overdose

There is no specific antidote for overdose with brivaracetam. Treatment of an overdose should include general supportive measures. Since less than 10 % of brivaracetam is excreted in urine, haemodialysis is not expected to significantly enhance brivaracetam clearance (see section 5.2).

## **5. PHARMACOLOGICAL PROPERTIES**

### **5.1 Pharmacodynamic properties**

Pharmacotherapeutic group: antiepileptics, other antiepileptics, ATC code: N03AX23

### Mechanism of action

Brivaracetam displays a high and selective affinity for synaptic vesicle protein 2A (SV2A), a transmembrane glycoprotein found at presynaptic level in neurons and in endocrine cells. Although the exact role of this protein remains to be elucidated it has been shown to modulate exocytosis of neurotransmitters. Binding to SV2A is believed to be the primary mechanism for brivaracetam anticonvulsant activity.

## Clinical efficacy and safety

The efficacy of brivaracetam for the adjunctive therapy of partial onset seizures (POS) was established in 3 randomized, double-blind, placebo-controlled, fixed-dose, multi-center clinical studies in subjects 16 years of age and older. The daily dose of brivaracetam ranged from 5 to 200 mg/day across these studies. All studies had an 8-week baseline period followed by a 12-week treatment period with no up-titration. 1,558 patients received study drug of which 1,099 received brivaracetam. Study enrollment criteria required that patients have uncontrolled POS despite treatment with either 1 or 2 concomitant AEDs. Patients were required to have at least 8 POS during the baseline period. The primary endpoints in the phase 3 studies were the percent reduction in POS frequency over placebo and the 50 % responder rate based on 50 % reduction in POS frequency from baseline.

The most commonly taken AEDs at the time of study entry were carbamazepine (40.6 %), lamotrigine (25.2 %), valproate (20.5 %), oxcarbazepine (16.0 %), topiramate (13.5 %), phenytoin (10.2 %) and levetiracetam (9.8 %). The median baseline seizure frequency across the 3 studies was 9 seizures per 28 days. Patients had a mean duration of epilepsy of approximately 23 years.

The efficacy outcomes are summarized in Table 2. Overall, brivaracetam was efficacious for the adjunctive treatment of partial onset seizures in patients 16 years of age and older between 50 mg/day and 200 mg/day.

*Table 2: Key Efficacy Outcomes for Partial Onset Seizure Frequency per 28 Days*

Study	Placebo	Brivaracetam		
		* Statistically significant (p-value)		
		50 mg/day	100 mg/day	200 mg/day
<b>Study N01253<sup>(1)</sup></b>				
	n= 96	n= 101		
50 % Responder rate	16.7	32.7* (p=0.008)	~	~
Percent reduction over placebo (%)	NA	22.0* (p=0.004)	~	~
<b>Study N01252<sup>(1)</sup></b>				
	n = 100	n = 99	n = 100	
50 % Responder rate	20.0	27.3 (p=0.372)	36.0 <sup>(2)</sup> (p=0.023)	~
Percent reduction over placebo (%)	NA	9.2 (p=0.274)	20.5 <sup>(2)</sup> (p=0.010)	~
<b>Study N01358</b>				
	n = 259		n = 252	n = 249
50% Responder rate	21.6	~	38.9* (p<0.001)	37.8* (p<0.001)
Percent reduction over placebo (%)	NA	~	22.8* (p<0.001)	23.2* (p<0.001)

n = randomised patients who received at least 1 dose of study medication

~ Dose not studied

\* Statistically significant

<sup>(1)</sup> Approximately 20 % of the patients were on concomitant levetiracetam

<sup>(2)</sup> The primary outcome for N01252 did not achieve statistical significance based on the sequential testing procedure, The 100 mg/day dose was nominally significant.

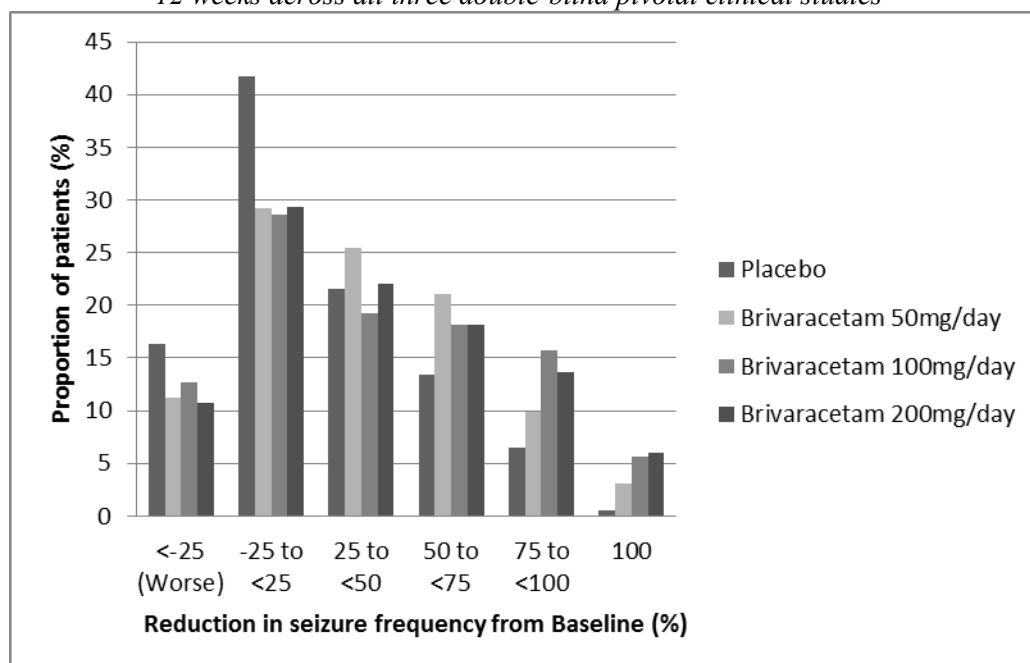
In clinical studies, a reduction in seizure frequency over placebo was higher with the dose of 100 mg/day than with 50 mg/day. Apart from dose-dependent increases in incidences of somnolence and fatigue, brivaracetam 50 mg/day and 100 mg/day had a similar safety profile including CNS-related AEs and with long-term use.

Figure 1 shows the percentage of patients (excluding patients with concomitant levetiracetam) by category of reduction from baseline in POS frequency per 28 days in all 3 studies. Patients with more than a 25 % increase in POS are shown at left as “worse”. Patients with an improvement in percent reduction in baseline POS frequency are shown in the 4 right-most categories. The percentages of



patients with at least a 50 % reduction in seizure frequency were 20.3 %, 34.2 %, 39.5 %, and 37.8 % for placebo, 50 mg/day, 100 mg/day, and 200 mg/day, respectively.

*Figure 1: Proportion of patients by category of seizure response for brivaracetam and placebo over 12 weeks across all three double-blind pivotal clinical studies*



In a pooled analysis of the three pivotal clinical studies, no differences in efficacy (measured as 50 % responder rate) was observed within the dose range of 50 mg/day to 200 mg/day when brivaracetam is combined with inducing or non-inducing AEDs. In clinical studies 2.5 % (4/161), 5.1 % (17/332) and 4.0% (10/249) of the patients on brivaracetam 50 mg/day, 100 mg/day and 200 mg/day respectively became seizure free during the 12-week treatment period compared with 0.5 % (2/418) on placebo.

Improvement in the median percent reduction in seizure frequency per 28 days has been observed in patients with type IC seizure (secondary generalized tonic-clonic seizures) at baseline treated with brivaracetam (66.6 % (n=62), 61.2 % (n=100) and 82.1 % (n=75) of the patients on brivaracetam 50 mg/day, 100 mg/day and 200 mg/day respectively as compared to placebo 33.3 % (n=115)).

The efficacy of brivaracetam in monotherapy has not been established. Brivaracetam is not recommended for use in monotherapy.

#### Treatment with levetiracetam

In two phase 3 randomised placebo-controlled clinical studies, levetiracetam was administered as concomitant AED in about 20 % of the patients. Although the number of subjects is limited, there was no observed benefit of brivaracetam versus placebo in patients taking levetiracetam concurrently which may reflect competition at the SV2A binding site. No additional safety or tolerability concerns were observed.

In a third study, a pre-specified analysis demonstrated efficacy over placebo for 100 mg/day and 200 mg/day in patients with prior exposure to levetiracetam. The lower efficacy observed in these patients compared to the levetiracetam-naïve patients was likely due to the higher number of prior AEDs used and higher baseline seizure frequency.

#### *Elderly (65 years of age and above)*

The three pivotal double-blind placebo-controlled clinical studies included 38 elderly patients aged between 65 and 80 years. Although data are limited, the efficacy was comparable to younger subjects.

### *Open label extension studies*

Across all studies, 81.7 % of the patients who completed randomized studies were enrolled in the long-term open-label extension studies. From entry into the randomized studies, 5.3 % of the subjects exposed to brivaracetam for 6 months (n=1,500) were seizure free compared to 4.6 % and 3.7 % for subjects exposed for 12 months (n=1,188) and 24 months (n=847), respectively. However, as a high proportion of subjects (26%) discontinued from the open-label studies due to lack of efficacy, a selection bias may have occurred, as the subjects who stayed in the study responded better than those who have terminated prematurely.

In patients who were followed up in the open-label extension studies for up to 8 years, the safety profile was similar to that observed in the short-term, placebo-controlled clinical studies.

### Paediatric population

In children aged 2 years and older, partial onset seizures have a similar pathophysiology to those in adolescents and adults. Experience with epilepsy medicines suggests that the results of efficacy studies performed in adults can be extrapolated to children down to the age of 2 years provided the paediatric dose adaptations are established and safety has been demonstrated (see sections 5.2 and 4.8). Doses in patients from 2 years of age were defined by weight-based dose adaptations which have been established to achieve similar plasma concentrations to the ones observed in adults taking efficacious doses (section 5.2).

A long-term, uncontrolled, open-label safety study included children (from 1 month of age to less than 16 years) who continued treatment after completing the PK study (see section 5.2), children who continued treatment after completing the i.v. (intravenous) safety study and children directly enrolled into the safety study. Children who directly enrolled received a brivaracetam starting dose of 1 mg/kg/day and depending on response and tolerability, the dose was increased up to 5 mg/kg/day by doubling the dose at weekly intervals. No child received a dose greater than 200 mg/day. For children weighing 50 kg or greater the brivaracetam starting dose was 50 mg/day and depending on response and tolerability, the dose was increased up to a maximum of 200 mg/day by weekly increments of 50 mg/day.

From the pooled open-label safety and PK studies in adjunctive therapy, 186 children with POS in the age range of 1 month < 16 years of age have received brivaracetam, of whom 149 have been treated for  $\geq 3$  months, 138 for  $\geq 6$  months, 123 for  $\geq 12$  months, 107 for  $\geq 24$  months, and 90 for  $\geq 36$  months.

The European Medicines Agency has deferred the obligation to submit the results of studies with brivaracetam in one or more subsets of the paediatric population in epilepsy with partial onset seizures (see section 4.2 for information on paediatric use).

## **5.2 Pharmacokinetic properties**

Brivaracetam film-coated tablets, oral solution and solution for intravenous injection show the same AUC, while the maximum plasma concentration is slightly higher after intravenous administration. Brivaracetam exhibits linear and time-independent pharmacokinetics with low intra- and inter-subject variability, and features complete absorption, very low protein binding, renal excretion following extensive biotransformation, and pharmacologically inactive metabolites.

### Absorption

Brivaracetam is rapidly and completely absorbed after oral administration and the absolute bioavailability is approximately 100 %. The median  $t_{\max}$  for tablets taken without food is 1 hour ( $t_{\max}$  range is 0.25 to 3 h).

Coadministration with a high-fat meal slowed down the absorption rate (median  $t_{\max}$  3 h) and decreased the maximum plasma concentration (37 % lower) of brivaracetam, while the extent of absorption remained unchanged.

## Distribution

Brivaracetam is weakly bound ( $\leq 20\%$ ) to plasma proteins. The volume of distribution is 0.5 L/kg, a value close to that of the total body water.

Due to its lipophilicity (Log P) brivaracetam has high cell membrane permeability.

## Biotransformation

Brivaracetam is primarily metabolized by hydrolysis of the amide moiety to form the corresponding carboxylic acid (approximately 60 % the elimination), and secondarily by hydroxylation on the propyl side chain (approximately 30 % the elimination). The hydrolysis of the amide moiety leading to the carboxylic acid metabolite (34 % of the dose in urine) is supported by hepatic and extra-hepatic amidase. *In vitro*, the hydroxylation of brivaracetam is mediated primarily by CYP2C19. Both metabolites, are further metabolised forming a common hydroxylated acid formed predominantly by hydroxylation of the propyl side chain on the carboxylic acid metabolite (mainly by CYP2C9). *In vivo*, in human subjects possessing ineffective mutations of CYP2C19, production of the hydroxy metabolite is decreased 10-fold while brivaracetam itself is increased by 22 % or 42 % in individuals with one or both mutated alleles. The three metabolites are not pharmacologically active.

## Elimination

Brivaracetam is eliminated primarily by metabolism and by excretion in the urine. More than 95 % of the dose, including metabolites, is excreted in the urine within 72 hours after intake. Less than 1 % of the dose is excreted in faeces and less than 10 % of brivaracetam is excreted unchanged in urine. The terminal plasma half-life ( $t_{1/2}$ ) is approximately 9 hours. The total plasma clearance in patients was estimated to 3.6 L/h.

## Linearity

Pharmacokinetics is dose-proportional from 10 to at least 600 mg.

## Interactions with medicinal products

Brivaracetam is cleared by multiple pathways including renal excretion, non-CYP-mediated hydrolysis and CYP-mediated oxidations. *In vitro*, brivaracetam is not a substrate of human P-glycoprotein (P-gp), multidrug resistance proteins (MRP) 1 and 2, and likely not organic anion transporter polypeptide 1B1 (OATP1B1) and OATP1B3.

*In vitro* assays showed that brivaracetam disposition should not be significantly affected by CYP (eg. CYP1A, CYP2C8, CYP2C9, CYP2D6 and CYP3A4) inhibitors.

*In vitro*, brivaracetam was not an inhibitor of the CYP1A2, CYP2A6, CYP2B6, CYP2C8, CYP2C9, CYP2D6, CYP3A4, or the transporters P-gp, BCRP, BSEP, MRP2, MATE-K, MATE-1, OATP1B1, OATP1B3, OAT1 and OCT1 at clinically relevant concentrations. *In vitro*, brivaracetam did not induce CYP1A2.

## Pharmacokinetics in special patient groups

### *Elderly (65 years of age and above)*

In a study in elderly subjects (65 to 79 years old; with creatinine clearance 53 to 98 ml/min/1.73 m<sup>2</sup>) receiving brivaracetam 400 mg/day in bid administration, the plasma half-life of brivaracetam was 7.9 hours and 9.3 hours in the 65 to 75 and >75 years groups, respectively. The steady-state plasma clearance of brivaracetam was similar (0.76 ml/min/kg) to young healthy male subjects (0.83 ml/min/kg). (see section 4.2).

#### *Renal impairment*

A study in subjects with severe renal impairment (creatinine clearance < 30 ml/min/1.73 m<sup>2</sup> and not requiring dialysis) revealed that the plasma AUC of brivaracetam was moderately increased (+21 %) relative to healthy controls, while the AUC of the acid, hydroxy and hydroxyacid metabolites were increased 3-, 4-, and 21-fold, respectively. The renal clearance of these non active metabolites was decreased 10-fold. The hydroxyacid metabolite did not reveal any safety concerns in non clinical studies. Brivaracetam has not been studied in patients undergoing hemodialysis (see section 4.2).

#### *Hepatic impairment*

A pharmacokinetic study in subjects with hepatic cirrhosis (Child-Pugh classes A, B, and C) showed similar increases in exposure to brivaracetam irrespective of disease severity (50 %, 57 % and 59 %), relative to matched healthy controls. (see section 4.2).

#### *Body weight*

A 40 % decrease in steady-state plasma concentration has been estimated across a body weight range from 46 kg to 115 kg. However, this is not considered to be a clinically relevant difference.

#### *Gender*

There are no clinically relevant differences in the pharmacokinetics of brivaracetam by gender.

#### *Race*

The pharmacokinetics of brivaracetam was not significantly affected by race (Caucasian, , Asian) in a population pharmacokinetic modeling from epilepsy patients. The number of patients with other ethnic background was limited.

#### Pharmacokinetic/pharmacodynamics relationship

The EC<sub>50</sub> (brivaracetam plasma concentration corresponding to 50 % of the maximum effect) was estimated to be 0.57 mg/L. This plasma concentration is slightly above the median exposure obtained after brivaracetam doses of 50 mg/day. Further seizure frequency reduction is obtained by increasing the dose to 100 mg/day and reaches a plateau at 200 mg/day.

#### Paediatric population

In a pharmacokinetic study with a 3-week evaluation period and weekly fixed 3-step up-titration using the brivaracetam oral solution, 99 subjects aged 1 month to < 16 years were evaluated. Brivaracetam was administered at weekly increasing doses of approximately 1 mg/kg/day, 2 mg/kg/day, and 4 mg/kg/day. All doses were adjusted by body weight, and did not exceed a maximum of 50 mg/day, 100 mg/day, and 200 mg/day. At the end of the evaluation period, subjects may have been eligible for entry into a long-term follow-up study continuing on their last received dose (see section 4.8). Plasma concentrations were shown to be dose-proportional in all age groups. Population pharmacokinetics modeling was performed based on sparse plasma concentration data collected in the 3-week PK study and the ongoing long-term follow-up study. 232 paediatric patients with epilepsy, aged 2 months to 17 years, were included in the analysis. The analysis indicated that doses of 5.0 (body weights 10-20 kg) and 4.0 mg/kg/day (body weights 20-50 kg) provide the same steady-state average plasma concentration as in adults receiving 200 mg/day. The estimated plasma clearance was 0.96 L/h, 1.61 L/h, 2.18 L/h and 3.19 L/h for children weighing 10 kg, 20 kg, 30 kg and 50 kg, respectively. In comparison, plasma clearance was estimated at 3.58 L/h in adult patients (70 kg body weight). Currently, no clinical data are available in neonates.

### **5.3 Preclinical safety data**

In safety pharmacology studies, the predominant effects were CNS related (mainly transient CNS depression and decreased spontaneous locomotor activity) seen at multiples (greater than 50 fold) of the pharmacologically active dose of brivaracetam, 2 mg/kg. Learning and memory function were not affected.

Findings not observed in clinical studies, but seen in the repeated-dose toxicology dog studies at exposure similar to the clinical plasma AUC, were hepatotoxic effects (mainly porphyria). However, toxicological data accumulated on brivaracetam and on a structurally-related compound indicate that the dog liver changes have developed through mechanisms not relevant for humans. No adverse liver changes were seen in rats and monkeys following chronic administration of brivaracetam at 5- and 42-fold the clinical AUC exposure. In monkeys, CNS signs (prostrate, loss of balance, clumsy movements) occurred at 64 fold the clinical  $C_{max}$ , these effects being less apparent over time.

Genotoxicity studies have not detected any mutagenic or clastogenic activity. Carcinogenicity studies did not indicate any oncogenic potential in rats, whereas increased incidences of hepatocellular tumors in male mice are considered to result of a non-genotoxic, mode of action linked to a phenobarbitone-like liver enzyme induction, which is a known rodent specific phenomenon.

Brivaracetam did not affect male or female fertility and has demonstrated no teratogenic potential in either rat or rabbit. Embryotoxicity was observed in rabbits at a maternal toxic dose of brivaracetam with an exposure level 8-fold the clinical AUC exposure at the maximum recommended dose. In rats, brivaracetam was shown to readily cross the placenta and to be excreted in milk of lactating rats with concentrations similar to maternal plasma levels.

Brivaracetam did not show any dependence potential in rats.

#### Juvenile animals studies

In juvenile rats, brivaracetam exposure levels 6- to 15-fold the clinical AUC exposure at the maximum recommended dose induced developmental adverse effects (i.e. mortality, clinical signs, decreased body weight and lower brain weight). There were no adverse effects on CNS function, neuropathological and brain histopathological examination. In juvenile dogs, the brivaracetam-induced changes at the exposure level 6- fold the clinical AUC were similar to those observed in adult animals. There were no adverse effects in any of the standard developmental or maturation endpoints.

## **6. PHARMACEUTICAL PARTICULARS**

### **6.1 List of excipients**

Sodium acetate (trihydrate)  
Acetic acid, glacial (for pH-adjustment)  
Sodium chloride  
Water for injections

### **6.2 Incompatibilities**

This medicinal product must not be mixed with other medicinal products.

### **6.3 Shelf life**

4 years.

Following dilution, brivaracetam solution for injection/infusion was found to be physically compatible and chemically stable when mixed with the diluents listed in the section 6.6 for 24 hours and stored in PVC or polyolefin bags at temperature up to 25°C. From a microbiological point of view, the product should be used immediately after dilution. If not used immediately, in-use storage time and conditions prior to use are the responsibility of the user.

### **6.4 Special precautions for storage**

This medicinal product does not require any special storage conditions.

For storage conditions after dilution of the medicinal product, see section 6.3.

#### **6.5 Nature and contents of container**

6 ml nominal capacity glass vials (type I) with siliconized bromobutyl rubber stoppers and sealed with an aluminium/polypropylene tear off cap. Each single use vial contains an extractable volume of not less than 5 ml of solution for injection/infusion.

Each carton contains 10 vials.

#### **6.6 Special precautions for disposal and other handling**

This medicinal product is for single use only, any unused solution should be discarded.

Product with particulate matter or discoloration should not be used.

Brivaracetam solution for injection/infusion is physically compatible and chemically stable when mixed with the following diluents

##### **Diluents**

- Sodium chloride 9 mg/ml (0.9 %) solution for injection
- Glucose 50 mg/ml (5 %) solution for injection
- Lactated Ringer's solution for injection.

Any unused medicinal product or waste material should be disposed of in accordance with local requirements.

### **7. MARKETING AUTHORISATION HOLDER**

UCB Pharma S.A.  
Allée de la Recherche 60  
B-1070 Bruxelles  
Belgium

### **8. MARKETING AUTHORISATION NUMBER(S)**

EU/1/15/1073/022

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

Date of first authorisation: 14 January 2016

Date of latest renewal: 9 October 2020

### **10. DATE OF REVISION OF THE TEXT**

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

## **ANNEX II**

- A. MANUFACTURER(S) 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. MANUFACTURER(S) RESPONSIBLE FOR BATCH RELEASE**

Name and address of the manufacturer responsible for batch release

UCB Pharma S.A.  
Chemin du Foriest  
B-1420 Braine l'Alleud  
Belgium

**B. CONDITIONS OR RESTRICTIONS REGARDING SUPPLY AND USE**

Medicinal product subject to medical prescription.

**C. OTHER CONDITIONS AND REQUIREMENTS OF THE MARKETING AUTHORISATION**

- **Periodic safety update reports (PSURs)**

The requirements for submission of PSURs 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)**

The marketing authorisation holder (MAH) shall perform the required pharmacovigilance activities and interventions detailed in the agreed RMP presented in Module 1.8.2 of the marketing authorisation and any agreed subsequent updates of the RMP.

An updated RMP should be submitted:

- At the request of the European Medicines Agency;
- Whenever the risk management system is modified, especially as the result of new information being received that may lead to a significant change to the benefit/risk profile or as the result of an important (pharmacovigilance or risk minimisation) milestone being reached.



**ANNEX III**  
**LABELLING AND PACKAGE LEAFLET**

## **A. LABELLING**

**PARTICULARS TO APPEAR ON THE OUTER PACKAGING****OUTER CARTON****1. NAME OF THE MEDICINAL PRODUCT**

Briviact 10 mg film-coated tablets  
brivaracetam

**2. STATEMENT OF ACTIVE SUBSTANCE(S)**

Each film-coated tablet contains 10 mg brivaracetam.

**3. LIST OF EXCIPIENTS**

Contains lactose monohydrate and lactose anhydrous.  
See leaflet for further information. *(Omitted from cartons of 14 film-coated tablets)*

**4. PHARMACEUTICAL FORM AND CONTENTS**

14 film-coated tablets  
56 film-coated tablets  
100 x 1 film-coated tablets  
14 x 1 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

**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**

UCB Pharma S.A.  
Allée de la Recherche 60  
B-1070 Bruxelles  
Belgium

**12. MARKETING AUTHORISATION NUMBER(S)**

EU/1/15/1073/001 14 film-coated tablets  
EU/1/15/1073/002 56 film-coated tablets  
EU/1/15/1073/003 100 x 1 film-coated tablets  
EU/1/15/1073/023 14 x 1 film-coated tablets

**13. BATCH NUMBER**

Lot

**14. GENERAL CLASSIFICATION FOR SUPPLY**

**15. INSTRUCTIONS ON USE**

**16. INFORMATION IN BRAILLE**

briviact 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 OUTER PACKAGING****OUTER CARTON OF MULTIPACK (WITH BLUE BOX)****1. NAME OF THE MEDICINAL PRODUCT**

Briviact 10 mg film-coated tablets  
brivaracetam

**2. STATEMENT OF ACTIVE SUBSTANCE(S)**

Each film-coated tablet contains 10 mg brivaracetam.

**3. LIST OF EXCIPIENTS**

Contains lactose monohydrate and lactose anhydrous.  
See leaflet for further information. *(Omitted from cartons of 14 film-coated tablets)*

**4. PHARMACEUTICAL FORM AND CONTENTS**

Multipack: 168 (3 packs of 56) 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

**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**

UCB Pharma S.A.  
Allée de la Recherche 60  
B-1070 Bruxelles  
Belgium

**12. MARKETING AUTHORISATION NUMBER(S)**

EU/1/15/1073/004 168 (3 packs of 56) film-coated tablets

**13. BATCH NUMBER**

Lot

**14. GENERAL CLASSIFICATION FOR SUPPLY**

**15. INSTRUCTIONS ON USE**

**16. INFORMATION IN BRAILLE**

briviact 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 OUTER PACKAGING**

**INTERMEDIATE CARTON WITHIN MULTIPACK (3 PACKS OF 56 FILM-COATED TABLETS) (WITHOUT BLUE BOX)**

**1. NAME OF THE MEDICINAL PRODUCT**

Briviact 10 mg film-coated tablets  
brivaracetam

**2. STATEMENT OF ACTIVE SUBSTANCE(S)**

Each film-coated tablet contains 10 mg brivaracetam.

**3. LIST OF EXCIPIENTS**

Contains lactose monohydrate and lactose anhydrous.  
See leaflet for further information. *(Omitted from cartons of 14 film-coated tablets)*

**4. PHARMACEUTICAL FORM AND CONTENTS**

56 film-coated tablets. Component of a multipack, can't be sold separately.

**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

**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**

UCB Pharma S.A.  
Allée de la Recherche 60  
B-1070 Bruxelles  
Belgium

**12. MARKETING AUTHORISATION NUMBER(S)**

**13. BATCH NUMBER**

Lot

**14. GENERAL CLASSIFICATION FOR SUPPLY**

**15. INSTRUCTIONS ON USE**

**16. INFORMATION IN BRAILLE**

briviact 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**

Briviact 10 mg tablets  
brivaracetam

**2. NAME OF THE MARKETING AUTHORISATION HOLDER**

UCB Pharma S.A. (logo)

**3. EXPIRY DATE**

EXP

**4. BATCH NUMBER**

Lot

**5. OTHER**

Calendar days: Mon., Tue., Wed., Thu., Fri., Sat., Sun.

*(not for pack sizes 14 x 1 and 100 x 1 film-coated tablet)*

**PARTICULARS TO APPEAR ON THE OUTER PACKAGING****OUTER CARTON****1. NAME OF THE MEDICINAL PRODUCT**

Briviact 25 mg film-coated tablets  
brivaracetam

**2. STATEMENT OF ACTIVE SUBSTANCE(S)**

Each film-coated tablet contains 25 mg brivaracetam.

**3. LIST OF EXCIPIENTS**

Contains lactose monohydrate and lactose anhydrous.  
See leaflet for further information. *(Omitted from cartons of 14 film-coated tablets)*

**4. PHARMACEUTICAL FORM AND CONTENTS**

14 film-coated tablets  
56 film-coated tablets  
100 x 1 film-coated tablets  
14 x 1 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

**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**

UCB Pharma S.A.  
Allée de la Recherche 60  
B-1070 Bruxelles  
Belgium

**12. MARKETING AUTHORISATION NUMBER(S)**

EU/1/15/1073/005 14 film-coated tablets  
EU/1/15/1073/006 56 film-coated tablets  
EU/1/15/1073/007 100 x 1 film-coated tablets  
EU/1/15/1073/024 14 x 1 film-coated tablets

**13. BATCH NUMBER**

Lot

**14. GENERAL CLASSIFICATION FOR SUPPLY**

**15. INSTRUCTIONS ON USE**

**16. INFORMATION IN BRAILLE**

briviact 25 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 CARTON OF MULTIPACK (WITH BLUE BOX)**

**1. NAME OF THE MEDICINAL PRODUCT**

Briviact 25 mg film-coated tablets  
brivaracetam

**2. STATEMENT OF ACTIVE SUBSTANCE(S)**

Each film-coated tablet contains 25 mg brivaracetam.

**3. LIST OF EXCIPIENTS**

Contains lactose monohydrate and lactose anhydrous.  
See leaflet for further information. *(Omitted from cartons of 14 film-coated tablets)*

**4. PHARMACEUTICAL FORM AND CONTENTS**

Multipack: 168 (3 packs of 56) 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

**9. SPECIAL STORAGE CONDITIONS**

<b>10. SPECIAL PRECAUTIONS FOR DISPOSAL OF UNUSED MEDICINAL PRODUCTS OR WASTE MATERIALS DERIVED FROM SUCH MEDICINAL PRODUCTS, IF APPROPRIATE</b>
--

<b>11. NAME AND ADDRESS OF THE MARKETING AUTHORISATION HOLDER</b>
---

UCB Pharma S.A.  
Allée de la Recherche 60  
B-1070 Bruxelles  
Belgium

<b>12. MARKETING AUTHORISATION NUMBER(S)</b>
--

EU/1/15/1073/008 168 (3 packs of 56) film-coated tablets

<b>13. BATCH NUMBER</b>
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Lot

<b>14. GENERAL CLASSIFICATION FOR SUPPLY</b>
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<b>15. INSTRUCTIONS ON USE</b>
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<b>16. INFORMATION IN BRAILLE</b>
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briviact 25 mg

<b>17. UNIQUE IDENTIFIER – 2D BARCODE</b>
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2D barcode carrying the unique identifier included.

<b>18. UNIQUE IDENTIFIER - HUMAN READABLE DATA</b>
--

PC  
SN  
NN

**PARTICULARS TO APPEAR ON THE OUTER PACKAGING**

**INTERMEDIATE CARTON WITHIN MULTIPACK (3 PACKS OF 56 FILM-COATED TABLETS) (WITHOUT BLUE BOX)**

**1. NAME OF THE MEDICINAL PRODUCT**

Briviact 25 mg film-coated tablets  
brivaracetam

**2. STATEMENT OF ACTIVE SUBSTANCE(S)**

Each film-coated tablet contains 25 mg brivaracetam.

**3. LIST OF EXCIPIENTS**

Contains lactose monohydrate and lactose anhydrous.  
See leaflet for further information. *(Omitted from cartons of 14 film-coated tablets)*

**4. PHARMACEUTICAL FORM AND CONTENTS**

56 film-coated tablets. Component of a multipack, can't be sold separatly.

**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

**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**

UCB Pharma S.A.  
Allée de la Recherche 60  
B-1070 Bruxelles  
Belgium

**12. MARKETING AUTHORISATION NUMBER(S)**

**13. BATCH NUMBER**

Lot

**14. GENERAL CLASSIFICATION FOR SUPPLY**

**15. INSTRUCTIONS ON USE**

**16. INFORMATION IN BRAILLE**

briviact 25 mg

**17. UNIQUE IDENTIFIER – 2D BARCODE**

**18. UNIQUE IDENTIFIER - HUMAN READABLE DATA**

<b>MINIMUM PARTICULARS TO APPEAR ON BLISTERS OR STRIPS</b>
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<b>BLISTER</b>
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<b>1. NAME OF THE MEDICINAL PRODUCT</b>
---

Briviact 25 mg tablets  
brivaracetam

<b>2. NAME OF THE MARKETING AUTHORISATION HOLDER</b>
--

UCB Pharma S.A. (logo)

<b>3. EXPIRY DATE</b>
-----------------------

EXP

<b>4. BATCH NUMBER</b>
------------------------

Lot

<b>5. OTHER</b>
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Calendar days: Mon., Tue., Wed., Thu., Fri., Sat., Sun.

*(not for pack sizes 14 x 1 and 100 x 1 film-coated tablet)*



**PARTICULARS TO APPEAR ON THE OUTER PACKAGING****OUTER CARTON****1. NAME OF THE MEDICINAL PRODUCT**

Briviact 50 mg film-coated tablets  
brivaracetam

**2. STATEMENT OF ACTIVE SUBSTANCE(S)**

Each film-coated tablet contains 50 mg brivaracetam.

**3. LIST OF EXCIPIENTS**

Contains lactose monohydrate and lactose anhydrous.  
See leaflet for further information. *(Omitted from cartons of 14 film-coated tablets)*

**4. PHARMACEUTICAL FORM AND CONTENTS**

14 film-coated tablets  
56 film-coated tablets  
100 x 1 film-coated tablets  
14 x 1 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

**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**

UCB Pharma S.A.  
Allée de la Recherche 60  
B-1070 Bruxelles  
Belgium

**12. MARKETING AUTHORISATION NUMBER(S)**

EU/1/15/1073/009 14 film-coated tablets  
EU/1/15/1073/010 56 film-coated tablets  
EU/1/15/1073/011 100 x 1 film-coated tablets  
EU/1/15/1073/025 14 x 1 film-coated tablets

**13. BATCH NUMBER**

Lot

**14. GENERAL CLASSIFICATION FOR SUPPLY**

**15. INSTRUCTIONS ON USE**

**16. INFORMATION IN BRAILLE**

briviact 50 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 CARTON of MULTIPACK (WITH BLUE BOX)****1. NAME OF THE MEDICINAL PRODUCT**

Briviact 50 mg film-coated tablets  
brivaracetam

**2. STATEMENT OF ACTIVE SUBSTANCE(S)**

Each film-coated tablet contains 50 mg brivaracetam.

**3. LIST OF EXCIPIENTS**

Contains lactose monohydrate and lactose anhydrous.  
See leaflet for further information. *(Omitted from cartons of 14 film-coated tablets)*

**4. PHARMACEUTICAL FORM AND CONTENTS**

Multipack: 168 (3 packs of 56) 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

**9. SPECIAL STORAGE CONDITIONS**

<b>10. SPECIAL PRECAUTIONS FOR DISPOSAL OF UNUSED MEDICINAL PRODUCTS OR WASTE MATERIALS DERIVED FROM SUCH MEDICINAL PRODUCTS, IF APPROPRIATE</b>
--

<b>11. NAME AND ADDRESS OF THE MARKETING AUTHORISATION HOLDER</b>
---

UCB Pharma S.A.  
Allée de la Recherche 60  
B-1070 Bruxelles  
Belgium

<b>12. MARKETING AUTHORISATION NUMBER(S)</b>
--

EU/1/15/1073/012 168 (3 packs of 56) film-coated tablets

<b>13. BATCH NUMBER</b>
-------------------------

Lot

<b>14. GENERAL CLASSIFICATION FOR SUPPLY</b>
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<b>15. INSTRUCTIONS ON USE</b>
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<b>16. INFORMATION IN BRAILLE</b>
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briviact 50 mg

<b>17. UNIQUE IDENTIFIER – 2D BARCODE</b>
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2D barcode carrying the unique identifier included.

<b>18. UNIQUE IDENTIFIER - HUMAN READABLE DATA</b>
--

PC  
SN  
NN

**PARTICULARS TO APPEAR ON THE OUTER PACKAGING**

**INTERMEDIATE CARTON WITHIN MULTIPACK (3 PACKS OF 56 FILM-COATED TABLETS)  
(WITHOUT BLUE BOX)**

**1. NAME OF THE MEDICINAL PRODUCT**

Briviact 50 mg film-coated tablets  
brivaracetam

**2. STATEMENT OF ACTIVE SUBSTANCE(S)**

Each film-coated tablet contains 50 mg brivaracetam.

**3. LIST OF EXCIPIENTS**

Contains lactose monohydrate and lactose anhydrous.  
See leaflet for further information. *(Omitted from cartons of 14 film-coated tablets)*

**4. PHARMACEUTICAL FORM AND CONTENTS**

56 film-coated tablets. Component of a multipack, can't be sold separately.

**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

**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**

UCB Pharma S.A.  
Allée de la Recherche 60  
B-1070 Bruxelles  
Belgium

**12. MARKETING AUTHORISATION NUMBER(S)**

**13. BATCH NUMBER**

Lot

**14. GENERAL CLASSIFICATION FOR SUPPLY**

**15. INSTRUCTIONS ON USE**

**16. INFORMATION IN BRAILLE**

briviact 50 mg

**17. UNIQUE IDENTIFIER – 2D BARCODE**

**18. UNIQUE IDENTIFIER - HUMAN READABLE DATA**

<b>MINIMUM PARTICULARS TO APPEAR ON BLISTERS OR STRIPS</b>
--

<b>BLISTER</b>
----------------

<b>1. NAME OF THE MEDICINAL PRODUCT</b>
---

Briviact 50 mg tablets  
brivaracetam

<b>2. NAME OF THE MARKETING AUTHORISATION HOLDER</b>
--

UCB Pharma S.A. (logo)

<b>3. EXPIRY DATE</b>
-----------------------

EXP

<b>4. BATCH NUMBER</b>
------------------------

Lot

<b>5. OTHER</b>
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Calendar days: Mon., Tue., Wed., Thu., Fri., Sat., Sun.

*(not for pack sizes 14 x 1 and 100 x 1 film-coated tablet)*

**PARTICULARS TO APPEAR ON THE OUTER PACKAGING**

**OUTER CARTON**

**1. NAME OF THE MEDICINAL PRODUCT**

Briviact 75 mg film-coated tablets  
brivaracetam

**2. STATEMENT OF ACTIVE SUBSTANCE(S)**

Each film-coated tablet contains 75 mg brivaracetam.

**3. LIST OF EXCIPIENTS**

Contains lactose monohydrate and lactose anhydrous.  
See leaflet for further information. *(Omitted from cartons of 14 film-coated tablets)*

**4. PHARMACEUTICAL FORM AND CONTENTS**

14 film-coated tablets  
56 film-coated tablets  
100 x 1 film-coated tablets  
14 x 1 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

**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**

UCB Pharma S.A.  
Allée de la Recherche 60  
B-1070 Bruxelles  
Belgium

**12. MARKETING AUTHORISATION NUMBER(S)**

EU/1/15/1073/013 14 film-coated tablets  
EU/1/15/1073/014 56 film-coated tablets  
EU/1/15/1073/015 100 x 1 film-coated tablets  
EU/1/15/1073/026 14 x 1 film-coated tablets

**13. BATCH NUMBER**

Lot

**14. GENERAL CLASSIFICATION FOR SUPPLY**

**15. INSTRUCTIONS ON USE**

**16. INFORMATION IN BRAILLE**

briviact 75 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 CARTON of MULTIPACK (WITH BLUE BOX)****1. NAME OF THE MEDICINAL PRODUCT**

Briviact 75 mg film-coated tablets  
brivaracetam

**2. STATEMENT OF ACTIVE SUBSTANCE(S)**

Each film-coated tablet contains 75 mg brivaracetam.

**3. LIST OF EXCIPIENTS**

Contains lactose monohydrate and lactose anhydrous.  
See leaflet for further information. *(Omitted from cartons of 14 film-coated tablets)*

**4. PHARMACEUTICAL FORM AND CONTENTS**

Multipack: 168 (3 packs of 56) 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

**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**

UCB Pharma S.A.  
Allée de la Recherche 60  
B-1070 Bruxelles  
Belgium

**12. MARKETING AUTHORISATION NUMBER(S)**

EU/1/15/1073/016 168 (3 packs of 56) film-coated tablets

**13. BATCH NUMBER**

Lot

**14. GENERAL CLASSIFICATION FOR SUPPLY**

**15. INSTRUCTIONS ON USE**

**16. INFORMATION IN BRAILLE**

briviact 75 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**

**INTERMEDIATE CARTON WITHIN MULTIPACK (3 PACKS OF 56 FILM-COATED TABLETS)  
(WITHOUT BLUEBOX)**

**1. NAME OF THE MEDICINAL PRODUCT**

Briviact 75 mg film-coated tablets  
brivaracetam

**2. STATEMENT OF ACTIVE SUBSTANCE(S)**

Each film-coated tablet contains 75 mg brivaracetam.

**3. LIST OF EXCIPIENTS**

Contains lactose monohydrate and lactose anhydrous.  
See leaflet for further information. *(Omitted from cartons of 14 film-coated tablets)*

**4. PHARMACEUTICAL FORM AND CONTENTS**

56 film-coated tablets. Component of a multipack, can't be sold separately.

**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

**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**

UCB Pharma S.A.  
Allée de la Recherche 60  
B-1070 Bruxelles  
Belgium

**12. MARKETING AUTHORISATION NUMBER(S)**

**13. BATCH NUMBER**

Lot

**14. GENERAL CLASSIFICATION FOR SUPPLY**

**15. INSTRUCTIONS ON USE**

**16. INFORMATION IN BRAILLE**

briviact 75 mg

**17. UNIQUE IDENTIFIER – 2D BARCODE**

**18. UNIQUE IDENTIFIER - HUMAN READABLE DATA**

<b>MINIMUM PARTICULARS TO APPEAR ON BLISTERS OR STRIPS</b>
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<b>BLISTER</b>
----------------

<b>1. NAME OF THE MEDICINAL PRODUCT</b>
---

Briviact 75 mg tablets  
brivaracetam

<b>2. NAME OF THE MARKETING AUTHORISATION HOLDER</b>
--

UCB Pharma S.A. (logo)

<b>3. EXPIRY DATE</b>
-----------------------

EXP

<b>4. BATCH NUMBER</b>
------------------------

Lot

<b>5. OTHER</b>
-----------------

Calendar days: Mon., Tue., Wed., Thu., Fri., Sat., Sun.

*(not for pack sizes 14 x 1 and 100 x 1 film-coated tablet)*

**PARTICULARS TO APPEAR ON THE OUTER PACKAGING****OUTER CARTON****1. NAME OF THE MEDICINAL PRODUCT**

Briviact 100 mg film-coated tablets  
brivaracetam

**2. STATEMENT OF ACTIVE SUBSTANCE(S)**

Each film-coated tablet contains 100 mg brivaracetam.

**3. LIST OF EXCIPIENTS**

Contains lactose monohydrate and lactose anhydrous.  
See leaflet for further information. *(Omitted from cartons of 14 film-coated tablets)*

**4. PHARMACEUTICAL FORM AND CONTENTS**

14 film-coated tablets  
56 film-coated tablets  
100 x 1 film-coated tablets  
14 x 1 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

**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**

UCB Pharma S.A.  
Allée de la Recherche 60  
B-1070 Bruxelles  
Belgium

**12. MARKETING AUTHORISATION NUMBER(S)**

EU/1/15/1073/017 14 film-coated tablets  
EU/1/15/1073/018 56 film-coated tablets  
EU/1/15/1073/019 100 x 1 film-coated tablets  
EU/1/15/1073/027 14 x 1 film-coated tablets

**13. BATCH NUMBER**

Lot

**14. GENERAL CLASSIFICATION FOR SUPPLY**

**15. INSTRUCTIONS ON USE**

**16. INFORMATION IN BRAILLE**

briviact 100 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 CARTON OF MULTIPACK (WITH BLUE BOX)****1. NAME OF THE MEDICINAL PRODUCT**

Briviact 100 mg film-coated tablets  
brivaracetam

**2. STATEMENT OF ACTIVE SUBSTANCE(S)**

Each film-coated tablet contains 100 mg brivaracetam.

**3. LIST OF EXCIPIENTS**

Contains lactose monohydrate and lactose anhydrous.  
See leaflet for further information. *(Omitted from cartons of 14 film-coated tablets)*

**4. PHARMACEUTICAL FORM AND CONTENTS**

Multipack: 168 (3 packs of 56) 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

**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**

UCB Pharma S.A.  
Allée de la Recherche 60  
B-1070 Bruxelles  
Belgium

**12. MARKETING AUTHORISATION NUMBER(S)**

EU/1/15/1073/020 168 (3 packs of 56) film-coated tablets

**13. BATCH NUMBER**

Lot

**14. GENERAL CLASSIFICATION FOR SUPPLY**

**15. INSTRUCTIONS ON USE**

**16. INFORMATION IN BRAILLE**

briviact 100 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**

**INTERMEDIATE CARTON WITHIN MULTIPACK (3 PACKS OF 56 FILM-COATED TABLETS)  
(WITHOUT BLUE BOX)**

**1. NAME OF THE MEDICINAL PRODUCT**

Briviact 100 mg film-coated tablets  
brivaracetam

**2. STATEMENT OF ACTIVE SUBSTANCE(S)**

Each film-coated tablet contains 100 mg brivaracetam.

**3. LIST OF EXCIPIENTS**

Contains lactose monohydrate and lactose anhydrous.  
See leaflet for further information. *(Omitted from cartons of 14 film-coated tablets)*

**4. PHARMACEUTICAL FORM AND CONTENTS**

56 film-coated tablets. Component of a multipack, can be sold separately.

**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

**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**

UCB Pharma S.A.  
Allée de la Recherche 60  
B-1070 Bruxelles  
Belgium

**12. MARKETING AUTHORISATION NUMBER(S)**

**13. BATCH NUMBER**

Lot

**14. GENERAL CLASSIFICATION FOR SUPPLY**

**15. INSTRUCTIONS ON USE**

**16. INFORMATION IN BRAILLE**

briviact 100 mg

**17. UNIQUE IDENTIFIER – 2D BARCODE**

**18. UNIQUE IDENTIFIER - HUMAN READABLE DATA**

<b>MINIMUM PARTICULARS TO APPEAR ON BLISTERS OR STRIPS</b>
--

<b>BLISTER</b>
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<b>1. NAME OF THE MEDICINAL PRODUCT</b>
---

Briviact 100 mg tablets  
brivaracetam

<b>2. NAME OF THE MARKETING AUTHORISATION HOLDER</b>
--

UCB Pharma S.A. (logo)

<b>3. EXPIRY DATE</b>
-----------------------

EXP

<b>4. BATCH NUMBER</b>
------------------------

Lot

<b>5. OTHER</b>
-----------------

Calendar days: Mon., Tue., Wed., Thu., Fri., Sat., Sun.

*(not for pack sizes 14 x 1 and 100 x 1 film-coated tablet)*

**PARTICULARS TO APPEAR ON THE OUTER PACKAGING AND IMMEDIATE PACKAGING**

**OUTER CARTON / BOTTLE**

**1. NAME OF THE MEDICINAL PRODUCT**

Briviact 10 mg/ml oral solution  
brivaracetam

**2. STATEMENT OF ACTIVE SUBSTANCE(S)**

Each ml of oral solution contains 10 mg brivaracetam.

**3. LIST OF EXCIPIENTS**

Contains sorbitol liquid (E420), propylene glycol (E1520) and methyl parahydroxybenzoate (E218).  
See leaflet for further information. *(Only for outer carton)*

**4. PHARMACEUTICAL FORM AND CONTENTS**

300 ml  
Two oral syringes (5 ml and 10 ml) with 2 adaptors are included in the carton. Check with your doctor which one you should use.  
Syringes 10 ml and 5ml *(as colored symbols - only for the outer carton)*

**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  
After first opening of the bottle, use within 8 months.  
Opening date *(Only for outer carton)*

**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**

UCB Pharma S.A.  
Allée de la Recherche 60 *(address only for outer carton)*  
B-1070 Bruxelles  
Belgium *(name and address only for outer carton, logo on carton and etiquette)*

**12. MARKETING AUTHORISATION NUMBER(S)**

EU/1/15/1073/021

**13. BATCH NUMBER**

Lot

**14. GENERAL CLASSIFICATION FOR SUPPLY**

**15. INSTRUCTIONS ON USE**

**16. INFORMATION IN BRAILLE**

briviact 10 mg/ml *(Only for outer carton)*

**17. UNIQUE IDENTIFIER – 2D BARCODE**

2D barcode carrying the unique identifier included. *(Only for outer carton)*

**18. UNIQUE IDENTIFIER - HUMAN READABLE DATA**

PC  
SN  
NN

*(Only for outer carton)*

**PARTICULARS TO APPEAR ON THE OUTER PACKAGING****OUTER CARTON****1. NAME OF THE MEDICINAL PRODUCT**

Briviact 10 mg/ml solution for injection/infusion  
brivaracetam

**2. STATEMENT OF ACTIVE SUBSTANCE(S)**

Each ml of solution for injection/infusion contains 10 mg brivaracetam.  
One vial of 5 ml contains 50 mg brivaracetam.

**3. LIST OF EXCIPIENTS**

Contains sodium acetate (trihydrate), glacial acetic acid, sodium chloride, water for injections.  
See leaflet for further information.

**4. PHARMACEUTICAL FORM AND CONTENTS**

50 mg/5 ml  
10 vials solution for injection/infusion

**5. METHOD AND ROUTE(S) OF ADMINISTRATION**

Read the package leaflet before use.  
Intravenous 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

**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**

UCB Pharma S.A.  
Allée de la Recherche 60  
B-1070 Bruxelles  
Belgium

**12. MARKETING AUTHORISATION NUMBER(S)**

EU/1/15/1073/022

**13. BATCH NUMBER**

Lot

**14. GENERAL CLASSIFICATION FOR SUPPLY**

**15. INSTRUCTIONS ON USE**

**16. INFORMATION IN BRAILLE**

Justification for not including Braille accepted

**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 SMALL IMMEDIATE PACKAGING UNITS****VIAL****1. NAME OF THE MEDICINAL PRODUCT AND ROUTE(S) OF ADMINISTRATION**

Briviact 10 mg/ml injection/infusion  
brivaracetam  
IV

**2. METHOD OF ADMINISTRATION****3. EXPIRY DATE**

EXP

**4. BATCH NUMBER**

Lot

**5. CONTENTS BY WEIGHT, BY VOLUME OR BY UNIT**

50 mg/5 ml

**6. OTHER**

## **B. PACKAGE LEAFLET**

## **Package leaflet: Information for the patient**

**Briviact 10 mg film-coated tablets**  
**Briviact 25 mg film-coated tablets**  
**Briviact 50 mg film-coated tablets**  
**Briviact 75 mg film-coated tablets**  
**Briviact 100 mg film-coated tablets**  
brivaracetam

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

## **1. What Briviact is and what it is used for**

### **What Briviact is**

Briviact contains the active substance brivaracetam. It belongs to a group of medicines called 'anti-epileptics'. These medicines are used to treat epilepsy.

### **What Briviact is used for**

- Briviact is used in adults, adolescents and children from 2 years of age.
- It is used to treat a type of epilepsy that has partial seizures with or without a secondary generalisation.
- Partial seizures are fits that start by only affecting one side of the brain. These partial seizures can spread and extend to larger areas on both sides of the brain – this is called a 'secondary generalisation'.
- You have been given this medicine to lower the number of fits (seizures) you have.
- Briviact is used together with other medicines for epilepsy.

## **2. What you need to know before you take Briviact**

### **Do not take Briviact if:**

- you are allergic to brivaracetam, other similar chemical compounds as levetiracetam or piracetam or any of the other ingredients of this medicine (listed in section 6). If you are not sure, talk to your doctor or pharmacist before taking Briviact.
- you have ever developed as severe skin rash or skin peeling, blistering and/or mouth sores after taking Briviact.

Serious skin reactions including Stevens-Johnson syndrome have been reported in association with Briviact treatment. Stop using Briviact and seek medical attention immediately if you notice any of the symptoms related to these serious skin reactions described in section 4.

## **Warnings and precautions**

Talk to your doctor or pharmacist before taking Briviact if:

- You have thoughts of harming or killing yourself. A small number of people being treated with anti-epileptic medicines such as Briviact have had thoughts of harming or killing themselves. If you have any of these thoughts at any time, contact your doctor immediately.
- You have liver problems - your doctor may need to adjust your dose.

## **Children**

Briviact is not recommended for use in children under 2 years of age.

## **Other medicines and Briviact**

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

In particular, tell your doctor if you are taking any of the following medicines – this is because your doctor may need to adjust your Briviact dose:

- Rifampicin - a medicine used to treat bacterial infections.
- St John's wort (also known as *Hypericum perforatum*) - a herbal medicine used to treat depression and anxiety as well as other conditions.

## **Briviact with alcohol**

- Combining this medicine with alcohol is not recommended.
- If you drink alcohol while taking Briviact the negative effects of alcohol may be increased.

## **Pregnancy and breast-feeding**

Fertile women should discuss the use of contraceptives with the doctor.

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

It is not recommended to take Briviact if you are pregnant, as the effects of Briviact on pregnancy and the unborn baby are not known.

It is not recommended to breast-feed your baby while taking Briviact, as Briviact passes into breast milk.

Do not stop treatment without talking to your doctor first. Stopping treatment could increase your seizures and harm your baby.

## **Driving and using machines**

- You may feel sleepy, dizzy or tired while taking Briviact.
- These effects are more likely at the start of the treatment or after a dose increase.
- Do not drive, cycle or use any tools or machines until you know how the medicine affects you.

## **Briviact contains lactose and sodium**

Briviact film-coated tablets contain:

- lactose (a type of sugar) - If you have been told by your doctor that you have an intolerance to some sugars, contact your doctor before taking this medicine.
- sodium – This medicine contains less than 1 mmol sodium (23mg) per tablet, that is to say essentially 'sodium free'.

## **3. How to take Briviact**

Always take this medicine exactly as your doctor has told you. Check with your doctor or pharmacist if you are not sure. Other form(s) of this medicine may be more suitable for certain patients e.g. children (if tablets can not be swallowed in whole, for example); ask your doctor or pharmacist.

You will take Briviact together with other medicines for epilepsy.

### **How much to take**

Your doctor will work out the right daily dose for you. Take the daily dose in two equal divided doses, approximately 12 hours apart.

#### Adolescents and children weighing 50 kg or more, and adults

- The recommended dose is from 25 mg to 100 mg taken twice a day . Your doctor may then decide to adjust your dose to find the best dose for you.

#### Adolescents and children weighing from 20 kg to less than 50 kg

- The recommended dose is from 0.5 mg to 2 mg for each kg of bodyweight, taken twice a day. Your doctor may then decide to adjust your dose to find the best dose for you.

#### Children weighing from 10 kg to less than 20 kg

- The recommended dose is from 0.5 mg to 2.5 mg for each kg of bodyweight, taken twice a day. Your child's doctor may then decide to adjust your child's dose to find the best dose for your child.

#### People with liver problems

If you have problems with your liver:

- As an adolescent or child weighing 50 kg or more, or as an adult, the maximum dose you will take is 75 mg twice a day.
- As an adolescent or child weighing from 20 kg to less than 50 kg, the maximum dose you will take is 1.5 mg for each kg of bodyweight twice a day.
- As a child weighing from 10 kg to less than 20 kg, the maximum dose your child will take is 2 mg for each kg of bodyweight twice a day.

### **How to take Briviact tablets**

- Swallow the tablets whole with a glass of liquid.
- The medicine may be taken with or without food.

### **How long to take Briviact for**

Briviact is a long term treatment – keep taking Briviact until your doctor tells you to stop.

### **If you take more Briviact than you should**

If you have taken more Briviact than you should, talk to your doctor. You may feel dizzy and sleepy. You may also have any of the following symptoms: feeling sick, a feeling of 'spinning', problems of keeping your balance, anxiety, feeling very tired, irritability, being aggressive, not being able to sleep, depression, thoughts or attempts of harming or killing yourself.

### **If you forget to take Briviact**

- If you miss a dose take it as soon as you remember.
- Then take your next dose at the time you would normally take it.
- Do not take a double dose to make up for a forgotten dose.
- If you are not sure what to do, ask your doctor or pharmacist.

### **If you stop taking Briviact**

- Do not stop taking this medicine unless your doctor tells you to. This is because stopping treatment could increase the number of fits you have.
- If your doctor asks you to stop taking this medicine they will lower your dose gradually. This helps to stop your fits coming back or getting worse

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.

**Very common:** may affect more than 1 in 10 people

- feeling sleepy or dizzy

**Common:** may affect up to 1 in 10 people

- flu
- feeling very tired (fatigue)
- convulsion, a feeling of 'spinning' (vertigo)
- feeling and being sick, constipation
- depression, anxiety, not being able to sleep (insomnia), irritability
- infections of the nose and throat (such as the 'common cold'), cough
- decreased appetite

**Uncommon:** may affect up to 1 in 100 people

- allergic reactions
- abnormal thinking and/or loss of touch with reality (psychotic disorder), being aggressive, nervous excitement (agitation)
- thoughts or attempts of harming or killing yourself: tell your doctor straight away
- a decrease in white blood cells (called 'neutropenia') - shown in blood tests

**Not known:** frequency cannot be estimated from the available data

- a widespread rash with blisters and peeling skin, particularly around the mouth, nose, eyes and genitals (Stevens-Johnson syndrome)

#### Additional side effects in children

**Common:** may affect up to 1 in 10 people

- restlessness and hyperactivity (psychomotor hyperactivity)

#### 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 Briviact

- 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 blister after EXP. The expiry date refers to the last day of that month.
- This medicinal product does not require any special storage conditions.
- 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 Briviact contains

The active substance is brivaracetam.

Each film-coated tablet contains 10 mg, 25 mg, 50 mg, 75 mg, or 100 mg brivaracetam.

The other ingredients are:

Core

Croscarmellose sodium, lactose monohydrate, betadex, lactose anhydrous, magnesium stearate

Coating

- 10 mg film-coated tablets: poly(vinyl alcohol), titanium dioxide (E171), macrogol (3350), talc.
- 25 mg film-coated tablets: poly(vinyl alcohol), titanium dioxide (E171), macrogol (3350), talc, iron oxide yellow (E172), iron oxide black (E172).
- 50 mg film-coated tablets: poly(vinyl alcohol), titanium dioxide (E171), macrogol (3350), talc, iron oxide yellow (E172), iron oxide red (E172).
- 75 mg film-coated tablets: poly(vinyl alcohol), titanium dioxide (E171), macrogol (3350), talc, iron oxide yellow (E172), iron oxide red (E172), iron oxide black (E172).
- 100 mg film-coated tablets: poly(vinyl alcohol), titanium dioxide (E171), macrogol (3350), talc, iron oxide yellow (E172), iron oxide black (E172).

**What Briviact looks like and contents of the pack**

Briviact 10 mg are white to off-white, round, film-coated tablets of 6.5 mm in diameter and debossed with 'u10' on one side.

Briviact 25 mg are grey, oval, film-coated tablets of 8.9 mm x 5.0 mm and debossed with 'u25' on one side.

Briviact 50 mg are yellow, oval, film-coated tablets of 11.7 mm x 6.6 mm and debossed with 'u50' on one side.

Briviact 75 mg are purple, oval, film-coated tablets of 13.0 mm x 7.3 mm and debossed with 'u75' on one side.

Briviact 100 mg are green-grey, oval, film-coated tablets of 14.5 mm x 8.1 mm and debossed with 'u100' on one side.

Briviact tablets are packaged in blister packs supplied in cardboard boxes containing either 14, 56, 14 x 1 or 100 x 1 film-coated tablets or in multipacks containing 168 (3 packs of 56) film-coated tablets.

All packs are available in PVC/PCTFE - Aluminium blisters.

Not all pack sizes may be marketed.

**Marketing Authorisation Holder**

UCB Pharma S.A., Allée de la Recherche 60, B-1070 Bruxelles, Belgium.

**Manufacturer**

UCB Pharma S.A., Chemin du Foriest, B-1420 Braine-l'Alleud, Belgium.

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

**België/Belgique/Belgien**

UCB Pharma SA/NV

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**Lietuva**

UCB Pharma Oy Finland

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UCB Magyarország Kft.

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Medis Adria d.o.o.  
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UCB (Pharma) Ireland Ltd.  
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**Κύπρος**

Lifepharm (Z.A.M.) Ltd  
Τηλ: + 357 22 05 63 00

**Latvija**

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Tel: + 358 9 2514 4221 (Somija)

**Nederland**

UCB Pharma B.V.  
Tel.: + 31 / (0)76-573 11 40

**Norge**

UCB Nordic A/S  
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UCB Nordic A/S  
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**This leaflet was last revised in {month YYYY}.**

**Other sources of information**

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

## **Package leaflet: Information for the patient**

### **Briviact 10mg/ml oral solution** brivaracetam

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

#### **1. What Briviact is and what it is used for**

##### **What Briviact is**

Briviact contains the active substance brivaracetam. It belongs to a group of medicines called 'anti-epileptics'. These medicines are used to treat epilepsy.

##### **What Briviact is used for**

- Briviact is used in adults, adolescents and children from 2 years of age.
- It is used to treat a type of epilepsy that has partial seizures with or without a secondary generalisation.
- Partial seizures are fits that start by only affecting one side of the brain. These partial seizures can spread and extend to larger areas on both sides of the brain – this is called a 'secondary generalisation'.
- You have been given this medicine to lower the number of fits (seizures) you have.
- Briviact is used together with other medicines for epilepsy.

#### **2. What you need to know before you take Briviact**

##### **Do not take Briviact if:**

- you are allergic to brivaracetam, other similar chemical compounds as levetiracetam or piracetam or any of the other ingredients of this medicine (listed in section 6). If you are not sure, talk to your doctor or pharmacist before taking Briviact.
  - you have ever developed as severe skin rash or skin peeling, blistering and/or mouth sores after taking Briviact.
- Serious skin reactions including Stevens-Johnson syndrome have been reported in association with Briviact treatment. Stop using Briviact and seek medical attention immediately if you notice any of the symptoms related to these serious skin reactions described in section 4.

## **Warnings and precautions**

Talk to your doctor or pharmacist before taking Briviact if:

- You have thoughts of harming or killing yourself. A small number of people being treated with anti-epileptic medicines such as Briviact have had thoughts of harming or killing themselves. If you have any of these thoughts at any time, contact your doctor immediately.
- You have liver problems - your doctor may need to adjust your dose.

## **Children**

Briviact is not recommended for use in children under 2 years of age.

## **Other medicines and Briviact**

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

In particular, tell your doctor if you are taking any of the following medicines – this is because your doctor may need to adjust your Briviact dose:

- Rifampicin - a medicine used to treat bacterial infections.
- St John's wort (also known as *Hypericum perforatum*) - a herbal medicine used to treat depression and anxiety as well as other conditions.

## **Briviact with alcohol**

- Combining this medicine with alcohol is not recommended.
- If you drink alcohol while taking Briviact the negative effects of alcohol may be increased.

## **Pregnancy and breast-feeding**

Fertile women should discuss the use of contraceptives with the doctor.

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

It is not recommended to take Briviact if you are pregnant, as the effects of Briviact on pregnancy and the unborn baby are not known.

It is not recommended to breast-feed your baby while taking Briviact, as Briviact passes into breast milk.

Do not stop treatment without talking to your doctor first. Stopping treatment could increase your seizures and harm your baby.

## **Driving and using machines**

- You may feel sleepy, dizzy or tired while taking Briviact.
- These effects are more likely at the start of the treatment or after a dose increase.
- Do not drive, cycle or use any tools or machines until you know how the medicine affects you.

## **Briviact oral solution contains methyl parahydroxybenzoate, sodium, sorbitol and propylene glycol**

- Methyl parahydroxybenzoate (E218): This may cause allergic reactions (possibly delayed).
- Sodium: This medicine contains less than 1 mmol sodium (23mg) per millilitre, that is to say essentially 'sodium free'
- Sorbitol (E420) (a type of sugar): This medicine contains 168 mg sorbitol in each ml. Sorbitol is a source of fructose. If your doctor has told you that you (or your child) have an intolerance to some sugars or if you have been diagnosed with hereditary fructose intolerance (HFI), a rare genetic disorder in which a person cannot break down fructose, talk to your doctor before you (or your child) take or receive this medicine.
- Propylene glycol (E1520): This medicine contains maximum 5.5 mg propylene glycol in each millilitre.

### 3. How to take Briviact

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

You will take Briviact together with other medicines for epilepsy.

#### How much to take

Your doctor will work out the right daily dose for you. Take the daily dose in two equal divided doses, approximately 12 hours apart.

#### Adolescents and children weighing 50 kg or more, and adults

- The recommended dose is from 25 mg to 100 mg taken twice a day. Your doctor may then decide to adjust your dose to find the best dose for you.

The table below only shows examples of doses to take and which syringe to use. Your doctor will work out the right dose for you and which syringe to use, depending on your weight.

#### **Dose in ml to be taken twice daily and which syringe to use - for adolescents and children weighing 50 kg or more, and adults:**

Weight	Dose in ml (corresponding to 25 mg)	Dose in ml (corresponding to 50 mg)	Dose in ml (corresponding to 75 mg)	Dose in ml (corresponding to 100 mg)
50 kg or more	2.5 ml	5 ml	7.5 ml	10 ml
	Use the 5 ml syringe (blue graduation marks)		Use the 10 ml syringe (black graduation marks)	

#### Adolescents and children weighing from 20 kg to less than 50 kg

- The recommended dose is from 0.5 mg to 2 mg for each kg of bodyweight, taken twice a day. Your doctor may then decide to adjust your dose to find the best dose for you.

The table below only shows examples of doses to take and which syringe to use. Your doctor will work out the right dose for you and which syringe to use, depending on your weight.

#### **Dose in ml to be taken twice daily and which syringe to use - for adolescents and children weighing from 20 kg to less than 50 kg:**

Weight	Dose in ml (corresponding to 0.5 mg/kg = 0.05 ml/kg)	Dose in ml (corresponding to 1 mg/kg = 0.1 ml/kg)	Dose in ml (corresponding to 1.5 mg/kg = 0.15 ml/kg)	Dose in ml (corresponding to 2 mg/kg = 0.2 ml/kg)
20 kg	1 ml	2 ml	3 ml	4 ml
25 kg	1.25 ml	2.5 ml	3.75 ml	5 ml
30 kg	1.5 ml	3 ml	4.5 ml	6 ml*
35 kg	1.75 ml	3.5 ml	5.25 ml*	7 ml*
40 kg	2 ml	4 ml	6 ml*	8 ml*
45 kg	2.25 ml	4.5 ml	6.75 ml*	9 ml*
	Use the 5 ml syringe (blue graduation marks)		For volume between 0.5 ml and 5 ml, use the 5 ml oral syringe (blue graduation marks)  * For volume above 5 ml and up to 10 ml, use the 10 ml oral syringe (black graduation marks)	

#### Children weighing from 10 kg to less than 20 kg

- The recommended dose is from 0.5 mg to 2.5 mg for each kg of bodyweight, taken twice a day. Your child's doctor may then decide to adjust your child's dose to find the best dose for your child.

The table below only shows examples of doses to take and which syringe to use. Your doctor will work out the right dose for you and which syringe to use, depending on your weight.

#### **Dose in ml to be taken twice daily and which syringe to use - for children weighing from 10 kg to less than 20 kg:**

<b>Weight</b>	<b>Dose in ml (corresponding to 0.5 mg/kg = 0.05 ml/kg)</b>	<b>Dose in ml (corresponding to 1.25 mg/kg = 0.125 ml/kg)</b>	<b>Dose in ml (corresponding to 1.5 mg/kg = 0.15 ml/kg)</b>	<b>Dose in ml (corresponding to 2 mg/kg = 0.2 ml/kg)</b>	<b>Dose in ml (corresponding to 2.5 mg/kg = 0.25 ml/kg)</b>
10 kg	0.5 ml	1.25 ml	1.5 ml	2 ml	2.5 ml
12 kg	0.6 ml	1.5 ml	1.8 ml	2.4 ml	3.0 ml
14 kg	0.7 ml	1.75 ml	2.1 ml	2.8 ml	3.5 ml
15 kg	0.75 ml	1.9 ml	2.25 ml	3 ml	3.75 ml
<b>Use the 5 ml syringe (blue graduation marks)</b>					

#### People with liver problems

If you have problems with your liver:

- As an adolescent or child weighing 50 kg or more, or as an adult, the maximum dose you will take is 75 mg twice a day.
- As an adolescent or child weighing from 20 kg to less than 50 kg, the maximum dose you will take is 1.5 mg for each kg of bodyweight twice a day.
- As a child weighing from 10 kg to less than 20 kg, the maximum dose your child will take is 2 mg for each kg of bodyweight twice a day.

#### **How to take Briviact oral solution**

- You can take Briviact oral solution on its own, or dilute it in water or juice shortly before swallowing.
- The medicine may be taken with or without food.

#### **Instructions for use for patients or carers:**

Two oral syringes will be provided in the carton. Check with your doctor which one you should use.

- For volume between 0.5 ml and 5 ml, you should use the 5 ml oral syringe (blue graduation marks) provided in the carton to ensure accurate dosing.
- For volume above 5 ml and up to 10 ml, you should use the 10 ml oral syringe (black graduation marks) provided in the carton to ensure accurate dosing.

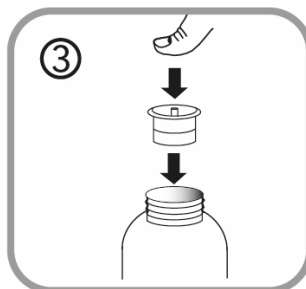
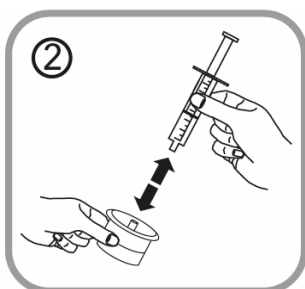
<b>5 ml oral dosing syringe</b>	<b>10 ml oral dosing syringe</b>
The 5 ml oral syringe has 2 overlapping blue graduation marks: in steps of 0.25 ml and in steps of 0.1 ml.	The 10 ml oral syringe has black graduation marks in steps of 0.25 ml.

- Open the bottle: press the cap and turn it anti-clockwise (figure 1).



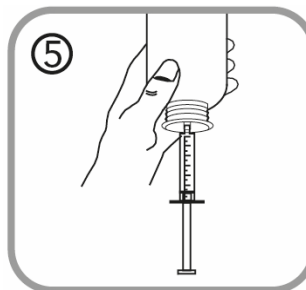
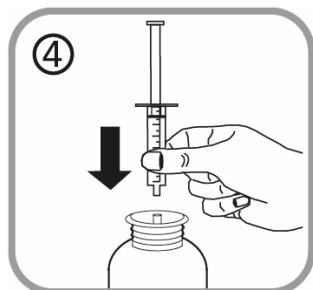
Follow these steps the first time you take Briviact:

- Take off the adaptor from the oral syringe (figure 2).
- Put the adaptor into the top of the bottle (figure 3). Make sure it is fixed well in place. You do not need to remove the adaptor after use.

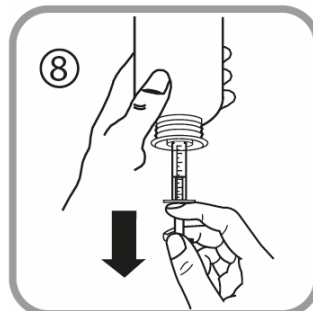
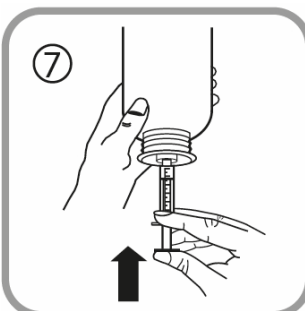
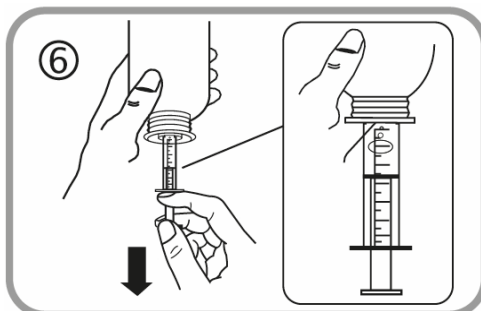


Follow these steps each time you take Briviact:

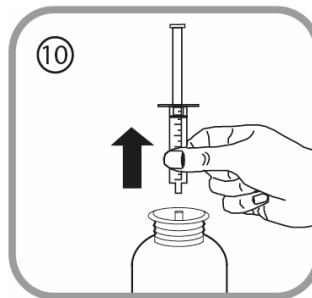
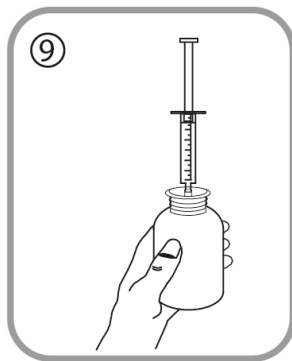
- Put the oral syringe into the adaptor opening (figure 4).
- Turn the bottle upside down (figure 5).



- Hold the bottle upside down in one hand and use the other hand to fill the oral syringe.
- Pull the plunger down to fill the oral syringe with a small amount of solution (figure 6).
- Then push the plunger up to remove any possible air bubbles (figure 7).
- Pull the plunger down to the millilitre (ml) dose marker on the oral syringe prescribed by your doctor (figure 8). The plunger may rise back up the barrel on the first dosage. Therefore, ensure that the plunger is kept in position until the oral syringe is disconnected from the bottle.

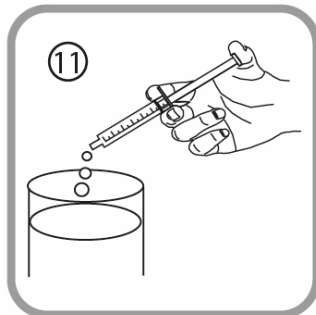


- Turn the bottle the right way up (figure 9).
- Take the oral syringe out of the adaptor (figure 10).

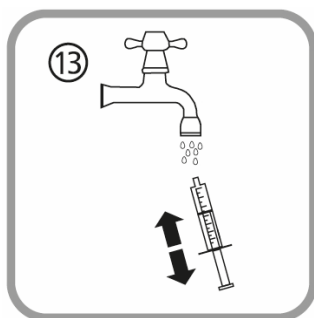


There are two ways in which you can choose to drink the medicine:

- empty the contents of the syringe into water (or juice) by pushing the plunger to the bottom of the oral syringe (figure 11) – you will then need to drink all of the water (add just enough to make it easy to drink) **or**
- drink the solution directly from the oral syringe without water – drink the whole contents of the syringe (figure 12).



- Close the bottle with the plastic screw cap (you do not need to remove the adaptor).
- To clean the oral syringe, rinse with cold water only, moving the plunger several times up and down to take up and expel the water, without separating the two components of the syringe (figure 13).



- Keep the bottle, the oral syringe, and the leaflet in the carton.

### **How long to take Briviact for**

Briviact is a long term treatment – keep taking Briviact until your doctor tells you to stop.

### **If you take more Briviact than you should**

If you have taken more Briviact than you should, talk to your doctor. You may feel dizzy and sleepy.

You may also have any of the following symptoms: feeling sick, a feeling of ‘spinning’, problems of keeping your balance, anxiety, feeling very tired, irritability, being aggressive, not being able to sleep, depression, thoughts or attempts of harming or killing yourself.

#### **If you forget to take Briviact**

- If you miss a dose take it as soon as you remember.
- Then take your next dose at the time you would normally take it.
- Do not take a double dose to make up for a forgotten dose.
- If you are not sure what to do, ask your doctor or pharmacist.

#### **If you stop taking Briviact**

- Do not stop taking this medicine unless your doctor tells you to. This is because stopping treatment could increase the number of fits you have.
- If your doctor asks you to stop taking this medicine they will lower your dose gradually. This helps to stop your fits coming back or getting worse.

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.

**Very common:** may affect more than 1 in 10 people

- feeling sleepy or dizzy

**Common:** may affect up to 1 in 10 people

- flu
- feeling very tired (fatigue)
- convulsion, a feeling of ‘spinning’ (vertigo)
- feeling and being sick, constipation
- depression, anxiety, not being able to sleep (insomnia), irritability
- infections of the nose and throat (such as the ‘common cold’), cough
- decreased appetite

**Uncommon:** may affect up to 1 in 100 people

- allergic reactions
- abnormal thinking and/or loss of touch with reality (psychotic disorder), being aggressive, nervous excitement (agitation)
- thoughts or attempts of harming or killing yourself: tell your doctor straight away
- a decrease in white blood cells (called ‘neutropenia’) - shown in blood tests

**Not known:** frequency cannot be estimated from the available data

- a widespread rash with blisters and peeling skin, particularly around the mouth, nose, eyes and genitals (Stevens-Johnson syndrome)

#### **Additional side effects in children**

**Common:** may affect up to 1 in 10 people

- restlessness and hyperactivity (psychomotor hyperactivity)

#### **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 Briviact

- 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 cardboard box and bottle after EXP. The expiry date refers to the last day of that month.
- This medicinal product does not require any special storage conditions.
- After first opening of the bottle, use within 8 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 Briviact contains

The active substance is brivaracetam.

Each millilitre (ml) contains 10 milligrams (mg) brivaracetam.

The other ingredients are: sodium citrate, citric acid anhydrous, methyl parahydroxybenzoate (E218), carmellose sodium, sucralose, sorbitol liquid (E420), glycerol (E422), raspberry flavour (propylene glycol (E1520) 90 % - 98 %), purified water.

### What Briviact looks like and contents of the pack

Briviact 10 mg/ml oral solution is slightly viscous, clear, colourless to yellowish liquid.

The 300 ml glass bottle of Briviact is packed in a cardboard box containing a 10 ml oral polypropylene/polyethylene syringe (black graduation marks), a 5 ml oral polypropylene/polyethylene syringe (blue graduation marks), and polyethylene adaptors for the syringes.

### Marketing Authorisation Holder

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### Manufacturer

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**This leaflet was last revised in {month YYYY}.**

**Other sources of information**

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

## **Package leaflet: Information for the patient**

### **Briviact 10mg/ml solution for injection/infusion** brivaracetam

**Read all of this leaflet carefully before you start using 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 Briviact is and what it is used for
2. What you need to know before you use Briviact
3. How to use Briviact
4. Possible side effects
5. How to store Briviact
6. Contents of the pack and other information

#### **1. What Briviact is and what it is used for**

##### **What Briviact is**

Briviact contains the active substance brivaracetam. It belongs to a group of medicines called 'anti-epileptics'. These medicines are used to treat epilepsy.

##### **What Briviact is used for**

- Briviact is used in adults, adolescents and children from 2 years of age.
- It is used to treat a type of epilepsy that has partial seizures with or without a secondary generalisation.
- Partial seizures are fits that start by only affecting one side of the brain. These partial seizures can spread and extend to larger areas on both sides of the brain – this is called a 'secondary generalisation'.
- You have been given this medicine to lower the number of fits (seizures) you have.
- Briviact is used together with other medicines for epilepsy.

#### **2. What you need to know before you take Briviact**

##### **Do not use Briviact if:**

- you are allergic to brivaracetam, other similar chemical compounds as levetiracetam or piracetam or any of the other ingredients of this medicine (listed in section 6). If you are not sure, talk to your doctor or pharmacist before taking Briviact.
- you have ever developed as severe skin rash or skin peeling, blistering and/or mouth sores after taking Briviact.

Serious skin reactions including Stevens-Johnson syndrome have been reported in association with Briviact treatment. Stop using Briviact and seek medical attention immediately if you notice any of the symptoms related to these serious skin reactions described in section 4.

### **Warnings and precautions**

Talk to your doctor or pharmacist before using Briviact if:

- You have thoughts of harming or killing yourself. A small number of people being treated with anti-epileptic medicines such as Briviact have had thoughts of harming or killing themselves. If you have any of these thoughts at any time, contact your doctor immediately.
- You have liver problems - your doctor may need to adjust your dose.

### **Children**

Briviact is not recommended for use in children under 2 years of age.

### **Other medicines and Briviact**

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

In particular, tell your doctor if you are taking any of the following medicines – this is because your doctor may need to adjust your Briviact dose:

- Rifampicin - a medicine used to treat bacterial infections.
- St John's wort (also known as *Hypericum perforatum*) - a herbal medicine used to treat depression and anxiety as well as other conditions.

### **Briviact with alcohol**

- Combining this medicine with alcohol is not recommended.
- If you drink alcohol while taking Briviact the negative effects of alcohol may be increased.

### **Pregnancy and breast-feeding**

Fertile women should discuss the use of contraceptives with the doctor.

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

It is not recommended to take Briviact if you are pregnant, as the effects of Briviact on pregnancy and the unborn baby are not known.

It is not recommended to breast-feed your baby while taking Briviact, as Briviact passes into breast milk.

Do not stop treatment without talking to your doctor first. Stopping treatment could increase your seizures and harm your baby.

### **Driving and using machines**

- You may feel sleepy, dizzy or tired while using Briviact.
- These effects are more likely at the start of the treatment or after a dose increase.
- Do not drive, cycle or use any tools or machines until you know how the medicine affects you.

### **Briviact contains sodium**

This medicine contains 19.1 mg sodium (main component of cooking/table salt) in each vial. This is equivalent to 1 % of the recommended maximum daily dietary intake of sodium for an adult.

## **3. How to use Briviact**

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

You will use Briviact together with other medicines for epilepsy.

- When you start taking this medicine you will take Briviact orally (as tablets or an oral solution) or be given it as an injection or infusion.

- Briviact solution for injection/infusion is used for a short amount of time when you cannot take Briviact orally.
- You can switch between taking Briviact orally to the solution for injection/infusion, and the other way around.

### **How much you will be given**

Your doctor will work out the right daily dose for you. Take the daily dose in two equal divided doses, approximately 12 hours apart.

#### Adolescents and children weighing 50 kg or more, and adults

- The recommended dose is from 25 mg to 100 mg taken twice a day. Your doctor may then decide to adjust your dose to find the best dose for you.

#### Adolescents and children weighing from 20 kg to less than 50 kg

- Your doctor may prescribe the injection only for a few days if you cannot take your medicine by mouth.
- The recommended dose is from 0.5 mg to 2 mg for each kg of bodyweight, taken twice a day. Your doctor may then decide to adjust your dose to find the best dose for you.

#### Children weighing from 10 kg to less than 20 kg

- Your child's doctor may prescribe the injection only for a few days if your child cannot take the medicine by mouth.
- The recommended dose is from 0.5 mg to 2.5 mg for each kg of bodyweight, taken twice a day. Your child's doctor may then decide to adjust your child's dose to find the best dose for your child.

#### People with liver problems

If you have problems with your liver:

- As an adolescent or child weighing 50 kg or more, or as an adult, the maximum dose you will take is 75 mg twice a day.
- As an adolescent or child weighing from 20 kg to less than 50 kg, the maximum dose you will take is 1.5 mg for each kg of bodyweight twice a day.
- As a child weighing from 10 kg to less than 20 kg, the maximum dose your child will take is 2 mg for each kg of bodyweight twice a day.

### **How Briviact is given**

Briviact is administered as an injection or infusion into a vein by a doctor or a nurse. The medicine is injected slowly into your vein or given as an infusion (drip) over 15 minutes.

### **How long to use Briviact for**

- Your doctor will decide for how many days you will be given the injections or infusion.
- For the long term treatment with Briviact, your doctor will ask to you to take Briviact tablets or oral solution.

### **If you have more Briviact than you should**

If you think you have been given too much Briviact, tell your doctor straight away.

### **If you stop using Briviact**

- Do not stop taking this medicine unless your doctor tells you to. This is because stopping treatment could increase the number of fits you have.
- If your doctor asks you to stop taking this medicine they will lower your dose gradually. This helps to stop your fits coming back or getting worse.

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.

**Very common:** may affect more than 1 in 10 people

- feeling sleepy or dizzy

**Common:** may affect up to 1 in 10 people

- flu
- feeling very tired (fatigue)
- convulsion, a feeling of 'spinning' (vertigo)
- feeling and being sick, constipation
- pain or discomfort at the injection or infusion site
- depression, anxiety, not being able to sleep (insomnia), irritability
- infections of the nose and throat (such as the 'common cold'), cough
- decrease appetite

**Uncommon:** may affect up to 1 in 100 people

- allergic reactions
- abnormal thinking and/or loss of touch with reality (psychotic disorder), being aggressive, nervous excitement (agitation)
- thoughts or attempts of harming or killing yourself: tell your doctor straight away
- a decrease in white blood cells (called 'neutropenia') - shown in blood tests

**Not known:** frequency cannot be estimated from the available data

- a widespread rash with blisters and peeling skin, particularly around the mouth, nose, eyes and genitals (Stevens-Johnson syndrome)

#### Additional side effects in children

**Common:** may affect up to 1 in 10 people

- restlessness and hyperactivity (psychomotor hyperactivity)

#### 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 Briviact

- 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 vial after EXP. The expiry date refers to the last day of that month.
- Briviact may be diluted before it is injected by your doctor or nurse. In such cases, it should be used straight after dilution.
- This medicinal product does not require any special storage conditions.
- Each vial of Briviact solution for injection/infusion must be used only once (single use). Any unused solution should be discarded.
- Only clear solution free from particles and discoloration should be used.
- 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 Briviact contains

The active substance is brivaracetam.

- Each ml contains 10 mg brivaracetam
- Each 5 ml vial contains 50 mg brivaracetam

The other ingredients are: sodium acetate (trihydrate), glacial acetic acid, sodium chloride, water for injections.

### What Briviact looks like and contents of the pack

Briviact 10 mg/ml solution for injection/infusion is a clear, colourless, sterile solution.

Briviact 10 mg/ml solution for injection/infusion 5 ml vial is packed in a carton box of 10 vials.

### Marketing Authorisation Holder

UCB Pharma S.A., Allée de la Recherche 60, B-1070 Bruxelles, Belgium.

### Manufacturer

UCB Pharma S.A., Chemin du Foriest, B-1420 Braine-l'Alleud, Belgium.

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**This leaflet was last revised in {month YYYY}.**

**Other sources of information**

Detailed information on this medicine is available on the European Medicines Agency web site:

<https://www.ema.europa.eu>.

**The following information is intended for medical or healthcare professionals only**

Briviact solution for injection/infusion can be administered as a bolus injection or as an infusion:

- Intravenous bolus: may be administered directly without dilution
- Intravenous infusion: may be administered over 15 minutes in a compatible diluent

Briviact may be diluted with the following solutions: sodium chloride 9 mg/ml (0.9 %), glucose 50 mg/ml (5 %) solution for injection or lactated Ringer's solution.

Each vial of Briviact solution for injection/infusion must be used only once (single use). Any unused solution should be discarded (see section 3).



**ANNEX IV**  
**SCIENTIFIC CONCLUSIONS AND GROUNDS FOR THE VARIATION TO THE TERMS**  
**OF THE MARKETING AUTHORISATION(S)**

### **Scientific conclusions**

Taking into account the PRAC Assessment Report on the PSUR(s) for brivaracetam, the scientific conclusions of PRAC are as follows:

In view of available data on Stevens-Johnson syndrome from spontaneous reports, including in 4 cases with close temporal relationship and positive dechallenge, and in view of a plausible mechanism of action, the PRAC considers a causal relationship between brivaracetam and Stevens-Johnson syndrome is at least a reasonable possibility. The PRAC concluded that the product information of products containing brivaracetam should be amended accordingly.

Having reviewed the PRAC recommendation, the CHMP agrees with the PRAC overall conclusions and grounds for recommendation.

### **Grounds for the variation to the terms of the marketing authorisation(s)**

On the basis of the scientific conclusions for brivaracetam the CHMP is of the opinion that the benefit-risk balance of the medicinal product(s) containing brivaracetam is unchanged subject to the proposed changes to the product information

The CHMP recommends that the terms of the marketing authorisation(s) should be varied.