

## NEW ZEALAND DATA SHEET

- 1 AVANZA 15 mg film-coated tablet\***  
**AVANZA 30 mg film-coated tablet**  
**AVANZA 45 mg film-coated tablet**

\*not available/marketed

## 2 QUALITATIVE AND QUANTITATIVE COMPOSITION

**AVANZA 15 mg:** Each tablet consists of 15 mg of mirtazapine.

**AVANZA 30 mg:** Each tablet consists of 30 mg of mirtazapine.

**AVANZA 45 mg:** Each tablet consists of 45 mg of mirtazapine.

Excipients with known effect: lactose

Each AVANZA 15 mg film-coated tablet contains not more than 114 mg lactose (as monohydrate).

Each AVANZA 30 mg film-coated tablet contains not more than 228 mg lactose (as monohydrate).

Each AVANZA 45 mg film-coated tablet contains not more than 342 mg lactose (as monohydrate).

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

## 3 PHARMACEUTICAL FORM

AVANZA 15\* mg tablets are yellow oval, biconvex and marked with 'Organon' on one side and a code (TZ3) on both sides of the score. The 15 mg tablets are scored.

\*not available/marketed.

AVANZA 30 mg tablets are red-brown oval, biconvex and marked with 'Organon' on one side and a code (TZ5) on both sides of the score. The 30 mg tablets are scored.

AVANZA 45 mg tablets are white oval, biconvex and marked with 'Organon' on one side and a code (TZ7) on the other side.

## 4 CLINICAL PARTICULARS

### 4.1 Therapeutic indications

Episode of major depression.

### 4.2 Dose and method of administration

#### Dose

#### Adults

Treatment should begin with 15 mg daily. The dosage generally needs to be increased to obtain an optimal clinical response. The effective daily dose is usually between 15 and 45 mg.

#### Elderly

The recommended dose is the same as that for adults. In elderly patients an increase in dosing should be done under close supervision to elicit a satisfactory and safe response.

### **Paediatric population**

Mirtazapine should not be used in patients under 18 years of age as efficacy was not demonstrated in two short-term clinical trials and because of safety concerns (see Section 4.1 Therapeutic indications, Section 4.4 Special warnings and precautions for use, and Section 4.8 Undesirable effects).

### **Method of administration**

The tablets should be taken orally, if necessary with fluid, and swallowed without chewing.

The clearance of mirtazapine may be decreased in patients with renal or hepatic insufficiency. This should be taken into account when prescribing AVANZA to this category of patients.

Mirtazapine has a half-life of 20-40 hours and, therefore, AVANZA is suitable for once-a-day administration. It should be taken preferably as a single night-time dose before going to bed.

AVANZA may also be given in sub-doses equally divided over the day (once in the morning and once at night-time).

Treatment should preferably be continued until the patient has been completely symptom-free for 4-6 months. After this, treatment can be gradually discontinued. Mirtazapine begins to exert its effect in general after 1-2 weeks of treatment. Treatment with an adequate dose should result in a positive response within 2-4 weeks. With an insufficient response, the dose can be increased up to the maximum dose. If there is no response within a further 2-4 weeks, then treatment should be stopped.

### **4.3 Contraindications**

Hypersensitivity to mirtazapine, or to any of the excipients in the tablet.

Concomitant use of mirtazapine with monoamine oxidase (MAO) inhibitors (see Section 4.5 Interactions with other medicines and other forms of interactions).

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

#### **Bone marrow depression**

Bone marrow depression, usually presenting as granulocytopenia or agranulocytosis, has been reported during treatment with AVANZA. This mostly appears after 4-6 weeks of treatment and is in general reversible after termination of treatment. However, in very rare cases agranulocytosis can be fatal. Reversible agranulocytosis has also been reported as a rare occurrence in clinical studies with AVANZA. In the postmarketing period with AVANZA very rare cases of agranulocytosis have been reported, mostly reversible, but in some cases fatal. Fatal cases mostly concerned patients with an age above 65. The physician should be alert for symptoms like fever, sore throat, stomatitis or other signs of infection; when such symptoms occur, treatment should be stopped and blood counts taken.

#### **Clinical worsening and suicide risk**

Patients of any age with Major Depressive Disorder may experience worsening of their depression and/or the emergence of suicidal ideation and behaviour (suicidality), whether or not they are taking antidepressant medications, and this risk may persist until significant remission occurs. Patients should be closely monitored, especially at the beginning of therapy or when the dose is changed, until such improvement occurs.

There has been a long-standing concern that some antidepressants may have a role in the emergence of suicidality in some patients. The possible risk of increased suicidality in patients applies to all classes of antidepressant medicines, as available data are not adequate to exclude this risk for any antidepressant. Therefore, consideration should be given to changing the therapeutic regimen, including possibly discontinuing the medication, in patients whose depression is persistently worse or whose emergent suicidality is severe, abrupt in onset, or

was not part of the patient's presenting symptoms. Generally, when stopping an antidepressant, doses should be tapered rather than stopped abruptly.

The following symptoms, anxiety, agitation, panic attacks, insomnia, irritability, hostility (aggressiveness), impulsivity, akathisia (psychomotor restlessness), hypomania and mania, have been reported in adult and paediatric patients being treated with antidepressants for major depressive disorder as well as for other indications, both psychiatric and non-psychiatric. Although a causal link between the emergence of such symptoms and either the worsening of depression and/or the emergence of suicidal impulses has not been established, consideration should be given to changing the therapeutic regimen, including possibly discontinuing the medication, in patients for whom such symptoms are severe, abrupt in onset, or were not part of the patient's presenting symptoms.

Because of the possibility of co-morbidity between major depressive disorder and other psychiatric and non-psychiatric disorders, the same precautions observed when treating patients with major depressive disorder should be observed when treating patients with other psychiatric and nonpsychiatric disorders.

### **Mania and bipolar disorder**

A major depressive episode may be the initial presentation of bipolar disorder. It is generally believed (though not established in controlled trials) that treating such an episode with any antidepressant alone may increase the likelihood of a mixed-manic episode in patients at risk for bipolar disorder. Prior to initiating treatment with an antidepressant, patients should be adequately screened to determine if they are at risk for bipolar disorder. It should be noted that mirtazapine is not approved for use in treating bipolar depression.

### **Information for patients and families**

Patients and their families should be alerted about the need to monitor for the emergence of anxiety, agitation, panic attacks, insomnia, irritability, hostility, impulsivity, akathisia, hypomania, mania, worsening of depression, and suicidal ideation, especially early during antidepressant treatment. Such symptoms should be reported to the patient's doctor, especially if they are severe, abrupt in onset, or were not part of the patient's presenting symptoms.

The patient has the right to treatment meeting appropriate ethical and professional standards, and the patient need to be fully informed with frank discussion of risk/benefit issues relating to this medicine's efficacy and safety when used in the treatment regimen proposed.

### **Cardiac disorders**

The effect of mirtazapine on QTc interval was assessed in a randomized, placebo and moxifloxacin controlled clinical trial involving 54 healthy volunteers using exposure response analysis. This trial revealed that both 45 mg (therapeutic) and 75 mg (supratherapeutic) doses of mirtazapine did not affect the QTc interval to a clinically meaningful extent. During the postmarketing use of mirtazapine, cases of QTc prolongation, Torsades de Pointes (TdP), ventricular tachycardia, and sudden death, have been reported. The majority of reports occurred in association with overdose or in patients with other risk factors for QTc prolongation/TdP including use of other QT prolonging medicines (see Section 4.5 Interactions with other medicines and other forms of interactions).

Therefore mirtazapine should be used with caution in patients with risk factors for QTc prolongation including congenital long QT syndrome, age >65 years, female sex, structural heart disease/LV dysfunction, hypokalaemia or hypomagnesaemia, medical conditions or concomitant use of medicines that inhibit the metabolism of mirtazapine, and the use of other QTc prolonging medicines.

An ECG should be performed in all patients experiencing symptoms that could be indicative of an arrhythmia (e.g. dizziness, palpitations, syncope or new onset seizures).

## Conditions which need supervision

Careful dosing as well as regular and close monitoring is necessary in patients with:

- Epilepsy and organic brain syndrome: Although clinical experience indicates that epileptic seizures are rare during mirtazapine treatment, as with other antidepressants, AVANZA should be introduced cautiously in patients who have a history of seizures. Treatment should be discontinued in any patient who develops seizures, or where there is an increase in seizure frequency.
- Hepatic impairment: Following a single 15 mg oral dose of mirtazapine, the clearance of mirtazapine was approximately 35% decreased in patients with mild or moderate hepatic impairment compared to subjects with normal hepatic function. The average plasma concentration of mirtazapine was about 55% increased.
- Renal impairment: Following a single 15 mg oral dose of mirtazapine, in patients with moderate ( $10 \text{ mL/min} \leq \text{creatinine clearance} < 40 \text{ mL/min}$ ) and severe ( $\text{creatinine clearance} < 10 \text{ mL/min}$ ) renal impairment the clearance of mirtazapine was about 30% and 50% decreased, respectively, compared to normal subjects. The average plasma concentration of mirtazapine was about 55% and 115% increased, respectively. No significant differences were found in patients with mild renal impairment ( $40 \text{ mL/min} \leq \text{creatinine clearance} < 80 \text{ mL/min}$ ) as compared to the control group.
- Cardiac diseases like conduction disturbances, angina pectoris and recent myocardial infarction, where normal precautions should be taken and concomitant medicines carefully administered.
- Low blood pressure.
- Diabetes mellitus: In patients with diabetes, antidepressants may alter glycaemic control. Insulin and/or oral hypoglycaemic dosage may need to be adjusted and close monitoring is recommended.

Like with other antidepressants, the following should be taken into account:

- Worsening of psychotic symptoms can occur when antidepressants are administered to patients with schizophrenia or other psychotic disturbances; paranoid thoughts can be intensified.
- When the depressive phase of bipolar disorder is being treated, it can transform into the manic phase. Patients with a history of mania/hypomania should be closely monitored. Mirtazapine should be discontinued in any patient entering a manic phase.
- Although AVANZA is not addictive, post-marketing experience shows that abrupt termination of treatment after long-term administration may sometimes result in withdrawal symptoms. The majority of withdrawal reactions are mild and self-limiting. Among the various reported withdrawal symptoms, dizziness, agitation, anxiety, headache and nausea are the most frequently reported. Even though they have been reported as withdrawal symptoms, it should be realized that these symptoms may be related to underlying disease. As advised under Section 4.2 Dose and method of administration, it is recommended to discontinue treatment with mirtazapine gradually.
- Care should be taken in patients with micturition disturbances like prostate hypertrophy and in patients with acute narrow-angle glaucoma and increased intra-ocular pressure (although there is little chance of problems with AVANZA because of its very weak anticholinergic activity).
- Akathisia/psychomotor restlessness: The use of antidepressants have been associated with the development of akathisia, characterised by a subjectively unpleasant or distressing restlessness and need to move often accompanied by an inability to sit or stand still. This is most likely to occur within the first few weeks of treatment. In patients who develop these symptoms, increasing the dose may be detrimental.
- With regard to the chance of suicide, in particular at the beginning of treatment, only the smallest amount of AVANZA tablets should be given to the patient consistent with good patient management, in order to reduce the risk of overdose.

## Jaundice

Treatment should be discontinued if jaundice occurs.

## Hyponatremia

Hyponatremia has been reported very rarely with the use of mirtazapine. Caution should be exercised in patients at risk, such as elderly patients or patients concomitantly treated with medications known to cause hyponatremia.

## Serotonin syndrome

Interaction with serotonergic active substances: serotonin syndrome may occur when selective serotonin reuptake inhibitors (SSRIs) are used concomitantly with other serotonergic active substances (see Section 4.5 Interactions with other medicines and other forms of interactions). Symptoms of serotonin syndrome may be hyperthermia, rigidity, myoclonus, autonomic instability with possible rapid fluctuations of vital signs, mental status changes that include confusion, irritability and extreme agitation progressing to delirium and coma. Caution should be advised and a closer clinical monitoring is required when these active substances are combined with mirtazapine. Treatment with AVANZA should be discontinued if such events occur and supportive symptomatic treatment initiated. From post marketing experience it appears that serotonin syndrome occurs very rarely in patients treated with AVANZA alone.

## Elderly patients

Elderly patients are often more sensitive, especially with regard to the undesirable effects of antidepressants. During clinical research with AVANZA, undesirable effects have not been reported more often in elderly patients than in other age groups.

## Lactose

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

## Paediatric population

AVANZA should not be used in the treatment of children and adolescents under the age of 18 years. Suicide-related behaviours (suicide attempt and suicidal thoughts), and hostility (predominantly aggression, oppositional behaviour and anger) were more frequently observed in clinical trials among children and adolescents treated with antidepressants compared to those treated with placebo. If, based on clinical need, a decision to treat is nevertheless taken, the patient should be carefully monitored for the appearance of suicidal symptoms. In addition, long-term safety data in children and adolescents concerning growth, maturation and cognitive and behavioural development are lacking.

## 4.5 Interactions with other medicines and other forms of interactions

### Pharmacodynamic Interactions

- Mirtazapine should not be administered concomitantly with MAO inhibitors or within two weeks after discontinuation of MAO inhibitor therapy. In the opposite way about two weeks should pass before patients treated with mirtazapine should be treated with MAO inhibitors (see Section 4.3 Contraindications). In addition, as with SSRIs, co-administration with other serotonergic active substances (L-tryptophan, triptans, tramadol, linezolid, methylene blue, SSRIs, venlafaxine, lithium and St John's wort – *Hypericum perforatum* – preparations) may lead to an incidence of serotonin associated effects (serotonin syndrome; see section 4.4 Special warnings and precautions for use).
- Mirtazapine may increase the sedating properties of benzodiazepines and other sedatives (notably most antipsychotics, histamine H1 antagonists, opioids). Caution should be exercised when these medicinal products are prescribed together with mirtazapine.

- Mirtazapine may increase the CNS depressant effect of alcohol. Patients should therefore be advised to avoid alcoholic beverages while taking mirtazapine.
- Mirtazapine dosed at 30 mg once daily caused a small but statistically significant increase in the international normalized ratio (INR) in subjects treated with warfarin. As at a higher dose of mirtazapine a more pronounced effect cannot be excluded, it is advisable to monitor the INR in case of concomitant treatment of warfarin with mirtazapine.

### **Medicines that can prolong the QTc interval**

The risk of QT prolongation and/or ventricular arrhythmias (e.g. Torsades de Pointes) may be increased with concomitant use of other medicines which prolong the QTc interval (e.g. some antipsychotics and antibiotics). Please check the data sheet of other medicines administered for information on their effects on the QTc interval (see Section 4.4 Special warnings and precautions for use).

### **Pharmacokinetic Interactions**

- Co-administration of the potent CYP3A4 inhibitor ketoconazole increased the peak plasma levels and the AUC of mirtazapine by approximately 40% and 50% respectively. Caution should be exercised and the dose may have to be decreased when co-administering mirtazapine with potent CYP3A4 inhibitors, HIV protease inhibitors, azole antifungals, erythromycin, cimetidine or nefazodone.
- Carbamazepine and phenytoin, CYP3A4 inducers, increased mirtazapine clearance about two-fold, resulting in a decrease in average plasma mirtazapine concentration of 60% and 45%, respectively. When carbamazepine or any another inducer of hepatic metabolism (such as rifampicin) is added to mirtazapine therapy, the mirtazapine dose may have to be increased. If treatment with such medicinal product is discontinued, it may be necessary to reduce the mirtazapine dose.
- When cimetidine (weak inhibitor of CYP 1A2, CYP 2D6 and CYP 3A4) is co-administered, the bioavailability of mirtazapine may be increased by more than 50%. The mirtazapine dose may have to be decreased when concomitant treatment with cimetidine is started or increased when cimetidine treatment is discontinued.
- Interaction studies did not indicate any relevant pharmacokinetic effects on concurrent treatment of mirtazapine with paroxetine, amitriptyline, risperidone or lithium.

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

### **Pregnancy**

Although studies in animals have not shown any teratogenic effects of toxicological significance, the safety of AVANZA in human pregnancy has not been established. AVANZA should be used during pregnancy only if it is clearly needed.

Some neonates exposed to antidepressants late in the third trimester have developed symptoms consistent with a drug discontinuation syndrome, which may require supportive care. If AVANZA is used until, or shortly before birth, postnatal monitoring of the newborn is recommended to account for possible discontinuation effects.

### **Breast-feeding**

Although animal experiments show that mirtazapine is excreted only in very small amounts in the milk, the use of AVANZA in nursing mothers is not recommended since no human data in breast milk are available.

### **Fertility**

See Section 5.3 Preclinical safety data.

## 4.7 Effects on ability to drive and use machines

AVANZA has minor to moderate influence on the ability to drive and use machines. AVANZA may impair concentration and alertness (particularly in the initial phase of treatment). Patients treated with antidepressants should avoid the performance of potentially dangerous tasks, which require alertness and good concentration, such as driving a motor vehicle or operating machinery, at any time when affected.

## 4.8 Undesirable effects

Depressed patients display a number of symptoms that are associated with the illness itself. It is, therefore, sometimes difficult to ascertain which symptoms are a result of the illness itself and which are a result of treatment with AVANZA.

The most commonly reported adverse reactions, occurring in more than 5% of patients treated with AVANZA in randomized placebo-controlled trials are somnolence, sedation, dry mouth, weight increased, increase in appetite, dizziness and fatigue.

All randomized placebo-controlled trials in patients (including indications other than major depressive disorder) have been evaluated for adverse reactions of AVANZA. The meta-analysis considered 20 trials, with a planned duration of treatment up to 12 weeks, with 1501 patients (134 person years) receiving doses of mirtazapine up to 60 mg and 850 patients (79 person years) receiving placebo. Extension phases of these trials have been excluded to maintain comparability to placebo treatment.

The table shows the categorized incidence of the adverse reactions, which occurred in the clinical trials statistically significantly more frequently during treatment with AVANZA than with placebo, added with the adverse reactions from spontaneous reporting. The frequencies of the adverse reactions from spontaneous reporting are based on the reporting rate of these events in the clinical trials. The frequency of adverse reactions from spontaneous reporting for which no cases in the randomized placebo-controlled patient trials were observed with mirtazapine has been classified as "not known".

System organ class	Very common (≥1/10)	Common (>1/100 to <1/10)	Uncommon (>1/1,000 to ≤1/100)	Rare (>1/10,000 to ≤1/1,000)	Frequency not known
Blood and the lymphatic system disorders					Bone marrow depression (granulocytopenia, agranulocytosis, aplastic anaemia and thrombocytopenia) (see also Section 4.4 Special warnings and precautions for use) Eosinophilia
Endocrine disorders					Hyperprolactinaemia (and related symptoms e.g. galactorrhea and gynaecomastia)

Metabolism and nutrition disorders	Increase in appetite <sup>1</sup> Weight increased <sup>1</sup>				Hyponatraemia
Psychiatric disorders		Abnormal dreams Anxiety <sup>2,5</sup> Confusion Insomnia <sup>3,5</sup>	Nightmares <sup>2</sup> Mania Agitation <sup>2</sup> Hallucinations Psychomotor restlessness (including akathisia, hyperkinesia)	Aggression	Suicidal ideation <sup>6</sup> Suicidal behaviour <sup>6</sup> Somnambulism
Nervous system disorders	Somnolence <sup>1,4</sup> Sedation <sup>1,4</sup> Headache <sup>2</sup>	Lethargy <sup>1</sup> Dizziness Tremor Amnesia	Paraesthesia <sup>2</sup> Restless legs Syncope	Myoclonus	Convulsions (insults) Serotonin syndrome Oral paraesthesia Dysarthria
Vascular disorders		Orthostatic hypotension	Hypotension		
Gastrointestinal disorders	Dry mouth	Nausea <sup>3</sup> Diarrhoea <sup>2</sup> Vomiting <sup>2</sup> Constipation <sup>1</sup>	Oral hypoaesthesia	Pancreatitis	Mouth oedema Increased salivation
Hepato-biliary disorders				Elevations in serum transaminase activities	
Skin and subcutaneous tissue disorders		Exanthema <sup>2</sup>			Stevens-Johnson syndrome Dermatitis bullous Erythema multiforme Toxic epidermal necrolysis Drug reaction with eosinophilia and systemic symptoms (DRESS)
Musculoskeletal, connective tissue and bone disorders		Arthralgia Myalgia Back pain <sup>1</sup>			Rhabdomyolysis <sup>7</sup>
Renal and urinary disorders					Urinary retention
Reproductive system and breast disorders					Priapism
General disorders and administration site conditions		Oedema peripheral <sup>1</sup> Fatigue			Generalised oedema Localised oedema
Investigations					Increased creatine kinase

<sup>1</sup> In clinical trials these events occurred statistically significantly more frequently during treatment with AVANZA than with placebo.



- <sup>2</sup> In clinical trials these events occurred more frequently during treatment with placebo than with AVANZA, however not statistically significantly more frequently.
- <sup>3</sup> In clinical trials these events occurred statistically significantly more frequently during treatment with placebo than with AVANZA.
- <sup>4</sup> N.B. dose reduction generally does not lead to less somnolence/sedation but can jeopardize antidepressant efficacy.
- <sup>5</sup> Upon treatment with antidepressants in general, anxiety and insomnia (which may be symptoms of depression) can develop or become aggravated. Under AVANZA treatment, development or aggravation of anxiety and insomnia has been reported.
- <sup>6</sup> Cases of suicidal ideation and suicidal behaviours have been reported during mirtazapine therapy or early after treatment discontinuation (see Section 4.4 Special warnings and precautions for use).
- <sup>7</sup> Cases of rhabdomyolysis have been reported in association with serotonin syndrome and multi-drug overdose. In the latter, a causative association with mirtazapine cannot be ascertained.

In laboratory evaluations in clinical trials transient increases in transaminases and gamma-glutamyltransferase have been observed (however associated adverse events have not been reported statistically significantly more frequently with AVANZA than with placebo).

### **Paediatric population**

The following adverse events were observed commonly in clinical trials in children: weight gain, urticaria and hypertriglyceridaemia (see also Section 4.1 Therapeutic indications).

### **Reporting suspected adverse reactions**

Reporting suspected adverse reactions after authorization of the medicine is important. It allows continued monitoring of the benefit/risk balance of the medicine. Healthcare professionals are asked to report any suspected adverse reactions <https://nzphvc.otago.ac.nz/reporting/>.

## **4.9 Overdose**

Present experience concerning overdose with AVANZA alone indicates that symptoms are usually mild. Depression of the central nervous system with disorientation and prolonged sedation have been reported, together with tachycardia and mild hyper- or hypotension. However, there is a possibility of more serious outcomes (including fatalities) at dosages much higher than the therapeutic dose, especially with mixed overdosages. In these cases QT prolongation and Torsade de Pointes have also been reported.

Cases of overdose should receive appropriate symptomatic and supportive therapy for vital functions. ECG monitoring should be undertaken. Activated charcoal or gastric lavage should also be considered.

For advice on the management of overdose please contact the National Poisons Centre on 0800 POISON (0800 764766).

## **5 PHARMACOLOGICAL PROPERTIES**

### **5.1 Pharmacodynamic properties**

Pharmacotherapeutic group: Other antidepressants, ATC code: N06AX11

#### **Mechanism of action**

Mirtazapine is a centrally active presynaptic  $\alpha_2$ -antagonist, which increases central noradrenergic and serotonergic neurotransmission. The enhancement of serotonergic neurotransmission is specifically mediated via 5-HT<sub>1</sub> receptors, because 5-HT<sub>2</sub> and 5-HT<sub>3</sub> receptors are blocked by mirtazapine. Both enantiomers of mirtazapine are presumed to contribute to the antidepressant activity, the S(+) enantiomer by blocking  $\alpha_2$  and 5-HT<sub>2</sub> receptors and the R(-) enantiomer by blocking 5-HT<sub>3</sub> receptors.

The histamine H1-antagonistic activity of mirtazapine is associated with its sedative properties. Mirtazapine is generally well tolerated. It has practically no anticholinergic activity and, at therapeutic doses, has only limited effects (e.g. orthostatic hypotension) on the cardiovascular system.

### **Paediatric population**

Two randomised, double-blind, placebo-controlled trials in children aged between 7 and 18 years with major depressive disorder (n=259) using a flexible dose for the first 4 weeks (15-45 mg mirtazapine) followed by a fixed dose (15, 30 or 45 mg mirtazapine) for another 4 weeks failed to demonstrate significant differences between mirtazapine and placebo on the primary and all secondary endpoints. Significant weight gain ( $\geq 7\%$ ) was observed in 48.8% of the Remeron treated subjects compared to 5.7% in the placebo arm. Urticaria (11.8% vs 6.8%) and hypertriglyceridaemia (2.9% vs 0%) were also commonly observed.

## **5.2 Pharmacokinetic properties**

### **Absorption and distribution**

After oral administration of AVANZA tablets, the active constituent mirtazapine is rapidly and well absorbed (bioavailability  $\approx 50\%$ ), reaching peak plasma levels after about 2 hours. Binding of mirtazapine to plasma proteins is approx. 85%. Food intake has no influence on the pharmacokinetics of mirtazapine.

### **Biotransformation**

Mirtazapine is extensively metabolized and eliminated via the urine and faeces within a few days. Major pathways of biotransformation are demethylation and oxidation, followed by conjugation. In vitro data from human liver microsomes indicate that cytochrome P450 enzymes CYP2D6 and CYP1A2 are involved in the formation of the 8-hydroxy metabolite of mirtazapine, whereas CYP3A4 is considered to be responsible for the formation of the N-demethyl and N-oxide metabolite. The demethyl metabolite is pharmacologically active and appears to have the same pharmacokinetic profile as the parent compound.

### **Elimination**

The mean half-life of elimination is 20-40 hours; longer half-lives, up to 65 hours, have occasionally been recorded and shorter half-lives have been seen in young men. The half-life of elimination is sufficient to justify once-a-day dosing. Steady state is reached after 3-4 days, after which there is no further accumulation.

### **Linearity/ non-linearity**

Mirtazapine displays linear pharmacokinetics within the recommended dose range.

The clearance of mirtazapine may be decreased as a result of renal or hepatic insufficiency.

## **5.3 Preclinical safety data**

Mirtazapine induced no effects of clinical relevance in chronic safety studies in rats and dogs or in reproductive toxicity studies in rats and rabbits. Mirtazapine was not genotoxic in a series of tests for gene mutation and chromosomal and DNA damage. Thyroid gland tumours found in a rat carcinogenicity study and hepatocellular neoplasms found in a mouse carcinogenicity study are considered to be species-specific, non-genotoxic responses associated with long-term treatment with high doses of hepatic enzyme inducers.

# **6 PHARMACEUTICAL PARTICULARS**

## **6.1 List of excipients**

AVANZA 15 mg, 30 mg and 45 mg tablets contain:

**Core:** maize starch, hypromellose, magnesium stearate, colloidal silicon dioxide, lactose monohydrate

**Coating layer:** hypromellose, macrogol 8000, titanium dioxide (E171)

AVANZA 15 mg tablets also contain yellow iron oxide (E172). The 30 mg tablets contain yellow iron oxide (E172) and red iron oxide (E172).

## **6.2 Incompatibilities**

Not applicable.

## **6.3 Shelf life**

The shelf-life for AVANZA tablets is 3 years. AVANZA tablets should not be used after the expiry date on the package.

## **6.4 Special precautions for storage**

AVANZA should be stored below 30°C, dry and in the original package in order to protect from light.

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

AVANZA tablets are packed in child-safe, push-through strips made of opaque white polyvinyl chloride film and aluminium foil containing a heat-seal coating on the side in contact with the tablets.

The following pack sizes are available:

- push-through strips with 10 yellow tablets each containing 15 mg mirtazapine (code TZ3)\*
- push-through strips with 10 red-brown tablets each containing 30 mg mirtazapine (code TZ5)
- push-through strips with 10 white tablets each containing 45 mg mirtazapine (code TZ7)

\*not available/marketed

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

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

# **7 MEDICINE SCHEDULE**

Prescription Medicine

# **8 SPONSOR**

Merck Sharp & Dohme (New Zealand) Limited  
P O Box 99851  
Newmarket  
Auckland 1149  
New Zealand  
Tel: 0800 500 673

# **9 DATE OF FIRST APPROVAL**

6 May 1999

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

31 July 2020

## SUMMARY TABLE OF CHANGES

Section Changed	Summary of new information
4.8	Inclusion of Amnesia
4.8	Inclusion of Drug reaction with eosinophilia and systemic symptoms (DRESS)

S-CCDS-MK8246-ALL-042020  
RCN000013169  
S-CCDS-MK8246-ALL-072020  
RCN000014670