AUSTRALIAN PRODUCT INFORMATION
TALAM (CITALOPRAM HYDROBROMIDE) TABLET

1 NAME OF THE MEDICINE
Citalopram hydrobromide

2 QUALITATIVE AND QUANTITATIVE COMPOSITION
Talam tablets contain 10 mg, 20 mg or 40mg of citalopram (as hydrobromide).

Excipient with known effect: sugars as lactose monohydrate. For the full list of excipients, see Section 6.1 List of excipients.

3 PHARMACEUTICAL FORM
Talam 10mg*: White to off-white, round, plain film-coated tablets containing 10mg citalopram (as hydrobromide).

Talam 20mg: White oval film-coated tablet containing 20 mg citalopram (as hydrobromide), marked C, scoreline, A on one side and blank on the other.

Talam 40mg*: White to off-white, oval, biconvex film-coated tablets containing 40mg citalopram (as hydrobromide), with ‘BL’ embossed on one side and ‘40’ on the other.

*not marketed

4 CLINICAL PARTICULARS

4.1 THERAPEUTIC INDICATIONS
Treatment of major depression.

4.2 DOSE AND METHOD OF ADMINISTRATION
Citalopram should be administered as a single daily dose. The dose may be taken in the morning or evening without regard for food.

Adults:
The starting dose is 20 mg/day. The dose can be increased in increments of 10 mg until satisfactory clinical response is achieved. The maximum dose is 40 mg/day. As the treatment result in general can be evaluated only after two to three weeks' treatment, possible dose increases should take place at intervals of two to three weeks.
**Elderly patients:**
The starting dose is 10 mg/day. The dose can be increased by 10 mg to a maximum of 20 mg/day. As the treatment result in general can be evaluated only after 2-3 weeks’ treatment, a possible dose increase should take place after an interval of 2-3 weeks.

**Reduced hepatic function:**
The maximum recommended dosage is 20 mg/day.

**Reduced renal function:**
Dosage adjustment is not necessary in patients with mild or moderate renal impairment. No information is available on treatment of patients with severely reduced renal function (creatinine clearance < 20 mL/minute).

**Poor metabolisers of CYP2C19 and patients taking CYP2C19 inhibitors:**
An initial dose of 10 mg daily during the first two weeks of treatment is recommended for patients who are known to be poor metabolisers with respect to CYP2C19. The dose may be increased to 20 mg daily depending on individual patient response (see section 5.2 Pharmacokinetic Properties). Patients taking cimetidine or other CYP2C19 inhibitors should not exceed the maximum dose of 20 mg/day.

**Duration of treatment:**
In treating depression, a treatment period of at least six months is usually necessary to provide adequate maintenance against the potential for relapse. Withdrawal symptoms have been seen on discontinuation of selective serotonin reuptake inhibitors. Abrupt discontinuation should be avoided. When stopping treatment with citalopram the dose should be gradually reduced over a period of a least one to two weeks in order to reduce the risk of withdrawal reactions (see section 4.4 SPECIAL WARNINGS AND PRECAUTIONS FOR USE). If intolerable symptoms occur following a decrease in the dose or upon discontinuation of treatment, then resuming the previously prescribed dose may be considered. Subsequently, the doctor may continue decreasing the dose, but at a more gradual rate.

**Children and adolescents (<18 years)**
The efficacy and safety of citalopram for the treatment of major depressive disorder have not been established in this population. Citalopram should not be used in children and adolescents under the age of 18 years.

### 4.3 CONTRAINDICATIONS

Hypersensitivity to citalopram and any excipients in Talam.

Congenital long QT syndrome (see section 4.4 SPECIAL WARNINGS AND PRECAUTIONS FOR USE).

**Concurrent administration of citalopram and monoamine oxidase inhibitors (MAOIs)** - Citalopram should not be used in combination with monoamine oxidase inhibitors (MAOI) or the reversible MAOI (RIMA), moclobemide, or within 14 days of discontinuing treatment with a MAOI, and at least one day after discontinuing treatment with the reversible MAOI (RIMA), moclobemide. Similarly, at least 14 days should be allowed after stopping citalopram before starting a MAOI or RIMA. Cases of serious reactions, such as potentially life-threatening serotonin syndrome (characterised by
neuromuscular excitation, altered mental status and autonomic dysfunction) have been reported in patients receiving an SSRI in combination with a monoamine oxidase inhibitor (MAOI) or the reversible MAOI (RIMA), moclobemide, and in patients who have recently discontinued an SSRI and have been started on a MAOI (see Precautions, Interactions with other medicines).

**Pimozide** – Concomitant administration of citalopram and pimozide is contraindicated due to the risk of QT interval prolongation (see section 4.5 Interactions with other medicines).

### 4.4 SPECIAL WARNINGS AND PRECAUTIONS FOR USE

**Use with caution in the following circumstances:**

**QT Prolongation and Torsade de Pointes**

Citalopram can cause a dose-dependent increase in the QT interval and should not be dosed above 40 mg/day. Torsade de Pointes has been reported postmarketing. Citalopram should not be used in patients with congenital long QT syndrome. Patients at higher risk of developing prolongation of the QT interval include those with congestive heart failure, bradyarrhythmias or a predisposition to hypokalaemia or hypomagnesaemia because of concomitant illness or drugs. Hypokalaemia and hypomagnesaemia should be corrected prior to initiation of treatment and periodically monitored. Consider more frequent ECG monitoring in these patients and those with other risk factors for QT prolongation. Dose escalations over 20 mg/day in elderly patients (>65 years), patients with hepatic dysfunction, CYP2C19 poor metabolisers or patients taking concomitant cimetidine or another CYP2C19 inhibitor are not recommended.

The influence of citalopram on QT interval at doses of 20 mg and 60 mg per day was evaluated in a randomised, placebo and active (moxifloxacin 400 mg) controlled cross-over, escalating multiple-dose study in 119 healthy subjects. The change from baseline in QTc (Fridericia correction) was 7.5 msec at the 20 mg/day dose and 16.7 msec at the 60 mg/day dose.

Citalopram has not been systematically evaluated in patients with a recent history of myocardial infarction or unstable heart disease. Patients with these diagnoses were generally excluded from clinical studies during the product’s premarket testing.

*Clinical worsening and suicide risk associated with psychiatric disorders*

The risk of suicide attempts is inherent in depression and may persist until significant remission occurs. The risk must be considered in all depressed patients.

Patients with depression may experience worsening of their depressive symptoms and/or emergence of suicidal ideation and behaviours (suicidality) whether or not they are taking antidepressant medications, and this risk may persist until significant remission occurs. As improvement may not occur during the first few weeks or more of treatment, patients should be closely monitored for clinical worsening and suicidality, especially at the beginning of a course of treatment, or at the time of dose changes, either increases or decreases.

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 patients presenting symptoms. Patients (and caregivers of patients) should be alerted about the need to monitor for any worsening of their
condition and/or the emergence of suicidal ideation/behaviour or thoughts of harming themselves and to seek medical advice immediately if these symptoms present.

Patients with co-morbid depression associated with other psychiatric disorders being treated with antidepressants should be similarly observed for clinical worsening and suicidality.

Patients with a history of suicide related events, or those exhibiting a significant degree of suicide ideation prior to commencement of treatment, are at greater risk of suicidal thoughts or suicide attempts and should receive careful monitoring during treatment.

Pooled analysis of 24 short-term (4 to 16 weeks) placebo-controlled trials of nine antidepressant medicines (SSRIs and others) in 4400 children and adolescents with major depressive disorder (16 trials), obsessive compulsive disorder (4 trials) or other psychiatric disorders (4 trials) have revealed a greater risk of adverse events representing suicidal behaviour or thinking (suicidality) during the first few months of treatment in those receiving antidepressants. The average risk of such events in patients treated with an antidepressant with 4% compared with 2% of patients taking a placebo. There was considerable variation in risk among the antidepressants but there was a tendency towards an increase for almost all antidepressants studied. The risk of suicidality was most consistently observed in the major depressive disorder trials but there were signals of risk arising from the trials in other psychiatric indications (obsessive compulsive disorder and social anxiety disorder) as well. No suicides occurred in these trials. It is unknown whether the suicidality risk in children and adolescent patients extends to use beyond several months. The nine antidepressant medicines in the pooled analyses included five SSRIs (citalopram, fluoxetine, fluvoxamine, paroxetine, sertraline) and four non-SSRIs (bupropion, mirtazapine, nefazodone, venlafaxine).

Pooled analysis of short-term studies of antidepressant medications have also shown an increased risk of suicidal thinking and behaviour, known as suicidality, in young adults aged 18 to 24 years during initial treatment (generally the first one to two months). Short-term studies did not show an increase in the risk of suicidality with antidepressants compared to placebo in adults beyond the age of 24 years, there was a reduction with antidepressants compared to placebo in adults aged 65 years and older.

Symptoms of anxiety, agitation, panic attacks, insomnia, irritability, hostility (aggressiveness), impulsivity, akathisia (psychomotor restlessness), hypomania and mania, have been reported in adults, adolescents and children 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 worsening of depression and/or emergence of suicidal impulses has not been established there is concern that such symptoms may be precursors of emerging suicidality.

Families and caregivers of children and adolescents being treated with antidepressants for major depressive disorder or for any other condition (psychiatric or non-psychiatric) should be informed about the need to monitor these patients for the emergence of agitation, irritability, unusual changes in behaviour, and other symptoms described above, as well as the emergence of suicidality, and to report such symptoms immediately to health care providers. It is particularly important that monitoring be undertaken during the initial few months of antidepressant treatment or at times of dose increase or decrease.
Prescriptions for Talam should be written for the smallest quantity of tablets consistent with good patient management, in order to reduce the risk of overdose.

Mania

In patients with manic-depressive illness, a change towards the manic phase may be associated with treatment with citalopram.

As with most antidepressants, citalopram should be discontinued if the patient enters a manic phase.

Hyponatraemia:

Hyponatraemia, probably due to inappropriate antidiuretic hormone secretion (SIADH), has been reported as a rare adverse reaction with the use of SSRIs. Especially elderly patients seem to be a risk group.

Akathisia/psychomotor restlessness:

The use of SSRIs/SNRIs has been associated with the development of akathisia, characterised by a subjectively unpleasant or distressing restlessness and need to move often accompanied by an ability to sit or stand still. This is most likely to occur within the first few weeks if treatment. In patients who develop these symptoms, increasing the dose may be detrimental and it may be necessary to review the use of SSRIs/SNRIs.

Seizures:

Although animal experiments have shown that citalopram has no epileptogenic potential it should, like other antidepressants, be used with caution in patients with a history of seizures.

Diabetes:

As described for other psychotropics, citalopram may modify insulin and glucose responses, calling for adjustment of the antidiabetic therapy in diabetic patients; in addition the depressive illness itself may affect patients' glucose balance.

ECT (electroconvulsive therapy):

There is little clinical experience of concurrent use of citalopram and electroconvulsive therapy (ECT), therefore caution is advised.

Discontinuation/withdrawal:

 Withdrawal symptoms when treatment is discontinued are common, particularly if discontinuation is abrupt.

The risk of withdrawal symptoms maybe dependent on several factors including the duration and dose of therapy and the rate of dose reduction. Dizziness, sensory disturbances (including paraesthesia), sleep disturbances (including insomnia and intense dreams), agitation or anxiety, nausea and/or vomiting, tremor, confusion, sweating, headache, diarrhoea, palpitations, emotional instability, irritability and visual disturbances are the most commonly reported reactions. Generally these symptoms are mild to moderate; however, in some patients they may be severe in intensity. They usually occur within the first few days of discontinuing treatment, but there have been very rare reports of such symptoms in patients who have inadvertently missed a dose.
Generally, these symptoms are self-limiting and usually resolve within two weeks, though in some individuals they may be prolonged (two or three months or more). It is therefore advised that citalopram should be gradually tapered when discontinuing treatment over a period of several weeks or months, according to the patient’s needs (see section 4.2 DOSE AND METHOD OF ADMINISTRATION).

**Use in patients with cardiac disease:**
Citalopram has not been evaluated or used to any appreciable extent in patients with a recent history of myocardial infarction or unstable heart disease. Like other SSRIs, citalopram causes a small decrease in heart rate. Consequently, caution should be observed when citalopram is initiated in patients with pre-existing slow heart rate.

**Preclinical safety:**
High doses of citalopram, which resulted in high plasma concentrations of citalopram and metabolites, have been associated with convulsions and ECG abnormalities in experimental animals.

**Haemorrhage:**
Bleeding abnormalities of the skin and mucous membranes have been reported with the use of SSRIs (including purpura, ecchymosis, haematoma, epistaxis, vaginal bleeding and gastrointestinal bleeding). Talam should therefore be used with caution in patients concomitantly treated with oral anticoagulants, medicinal products known to affect platelet function (e.g. atypical antipsychotics and phenothiazines, most tricyclic antidepressants, aspirin (acetylsalicylic acid) and non-steroidal anti-inflammatory medicinal products (NSAIDs), ticlopidine and dipyridamole) as well as in patients with a past history of abnormal bleeding or those with predisposing conditions. Pharmacological gastroprotection should be considered for high risk patients.

**Excipients:**
The tablets contain lactose. Patients with rare hereditary problems of galactose intolerance, the Lapp lactose deficiency or glucose-galactose malabsorption should not receive this medicine.

**Use in the elderly**
No data available.

**Paediatric use**
The safety and efficacy of citalopram for the treatment of major depressive disorder has not been established in children and adolescents less than 18 years of age. Consequently, citalopram should not be used in children and adolescents less than 18 years of age.

**Effects on laboratory tests**
No data available.

4.5 **INTERACTIONS WITH OTHER MEDICINES AND OTHER FORMS OF INTERACTIONS**

**Drugs that prolong the QT interval:**
More frequent ECG monitoring is recommended in patients on concomitant medications that prolong the QT interval (see section 4.4 SPECIAL WARNINGS AND PRECAUTIONS FOR USE – QT Prolongations and Torsade de Pointes).
**MAOIs:**

Monoamine oxidase inhibitors (MAOIs) should not be used in combination with SSRIs (see section 4.3 CONTRAINDICATIONS).

Treatment with citalopram may be instituted 14 days after discontinuation of irreversible MAOIs and a minimum of one drug free day after discontinuation of moclobemide. Treatment with MAOIs may be introduced 14 days after discontinuation of citalopram.

**Serotonin syndrome**

Development of serotonin syndrome may occur in association with treatment with SSRIs and SNRIs, particularly when given in combination with MAOIs or other serotonergic agents. Symptoms and signs of serotonin syndrome include rapid onset of neuromuscular excitation (hyperreflexia, incoordination, myoclonus, tremor), altered mental status (confusion, agitation, hypomania) and autonomic dysfunction (diaphoresis, diarrhoea, fever, shivering and rapidly fluctuating vital signs). Treatment with citalopram should be discontinued if such events occur and supportive symptomatic treatment initiated.

**Pimozide:**

Co-administration of a single dose of pimozide 2 mg to subjects treated with racemic citalopram 40 mg/day for 11 days caused an increase in AUC and Cmax of pimozide, although not consistently throughout the study. The co-administration of pimozide and citalopram resulted in a mean increase in the QTc interval of approximately 10msec. Due to the interaction noted at a low dose of pimozide, concomitant administration of citalopram and pimozide is contraindicated (see section 4.3 CONTRAINDICATIONS).

**Serotonergic drugs:**

SSRIs may theoretically interact with 5-HT agonists. Co-administration with serotonergic drugs (e.g. tramadol, sumatriptan) may lead to enhancement of 5-HT associated effects. Until further evidence is available it is advised not to use citalopram simultaneously with 5-HT agonists. Similarly, *Hypericum perforatum* (St John’s Wort) should be avoided as adverse interactions have been reported with a range of drugs including antidepressants.

**Hepatic enzymes:**

The metabolism of citalopram is only partly dependent on the hepatic cytochrome P450 isozyme CYP2D6 and, unlike some other SSRIs, citalopram is only a weak inhibitor of this important enzyme system which is involved in the metabolism of many drugs (including antiarrhythmics, neuroleptics, beta-blockers, tricyclic antidepressants and some SSRIs).

*In vitro* enzyme inhibition data did not reveal an inhibitory effect of citalopram on CYP3A4, but did suggest that it is a weak inhibitor of CYP1A2, -2D6, and -2C19. Citalopram would be expected to have little inhibitory effect on *in vivo* metabolism mediated by these isoenzymes. However, *in vivo* data to address this question are very limited.
Citalopram steady state levels were not significantly different in poor metabolisers and extensive -2D6 metabolisers after multiple dose administration of citalopram hydrobromide, suggesting that co-administration, with citalopram hydrobromide, of a drug that inhibits CYP2D6, is unlikely to have clinically significant effects on citalopram metabolism.

Since CYP3A4 and -2C19 are the primary enzymes involved in the metabolism of citalopram, it is expected that potent inhibitors of -3A4 (e.g. ketoconazole, itraconazole, and macrolide antibiotics) and potent inhibitors of CYP2C19 (e.g. omeprazole, cimetidine) might decrease the clearance of citalopram. Citalopram 20 mg/day is the maximum recommended dose for patients taking concomitant cimetidine or another CYP2C19 inhibitor because of the risk of QT prolongation (see section 4.2 DOSE AND METHOD OF ADMINISTRATION).

**Medicines that interfere with haemostasis (NSAIDs, aspirin, warfarin, etc):** Serotonin release by platelets plays an important role in haemostasis. There is an association between use of psychotropic drugs that interfere with serotonin reuptake and the occurrence of abnormal bleeding. Concurrent use of an NSAID, aspirin or warfarin potentiates the risk. Thus, patients should be cautioned about using such medicines concurrently with Talam.

**Lithium and tryptophan:** There is no pharmacokinetic interaction between lithium and citalopram. However, there have been reports of enhanced serotoninergic effects when SSRIs have been given with lithium or tryptophan and therefore the concomitant use of citalopram with these drugs should be undertaken with caution. Increased monitoring of lithium levels is not required.

**Imipramine and other tricyclic antidepressants (TCAs):** In a pharmacokinetic study, no effect was demonstrated on either citalopram or imipramine levels, although the level of desipramine, the primary metabolite of imipramine, was increased. The clinical significance of the desipramine change is unknown. Nevertheless, caution is indicated in the coadministration of citalopram and tricyclic antidepressants.

**Digoxin:** In subjects who had received 21 days of citalopram 40 mg/day, combined administration with digoxin (single dose of 1 mg) did not significantly affect the pharmacokinetics of either citalopram or digoxin.

**Warfarin:** Administration of citalopram 40 mg/day for 21 days did not affect the pharmacokinetics of warfarin, a CYP3A4 substrate. Prothrombin time was increased by 5%, the clinical significance of which is unknown.

**Carbamazepine:** Combined administration of citalopram (40 mg/day for 14 days) and carbamazepine (titrated to 400 mg/day for 35 days) did not significantly affect the pharmacokinetics of carbamazepine, a CYP3A4 substrate. Although trough citalopram plasma levels were unaffected, given the enzyme inducing properties of carbamazepine, the possibility that carbamazepine might increase the clearance of citalopram should be considered if the two drugs are coadministered.

**Metoprolol:** A pharmacokinetic interaction between citalopram and metoprolol was observed, resulting in a twofold increase in metoprolol concentrations. The change in metabolism of metoprolol suggests an interaction between metoprolol and demethylcitalopram related to the CYP2D6 isoenzyme. There was no statistically significant increase in the effect of metoprolol on blood pressure and heart rate in healthy volunteers by adding citalopram.
Cimetidine: Cimetidine caused a moderate increase in the average steady-state levels of citalopram. Citalopram 20 mg/day is the maximum recommended dose for patients taking concomitant cimetidine because of the risk of QT prolongation.

Medicines affecting the central nervous system – Given the primary CNS effects of citalopram, caution should be used when it is taken in combination with other centrally acting drugs.

Medicines lowering the seizure threshold – SSRIs can lower the seizure threshold. Caution is advised when concomitantly using other medicinal products capable of lowering the seizure threshold (e.g. antidepressants (tricyclics, SSRIs), neuroleptics (phenothiazines, thioxanthenes, butyrophenones), mefloquine, bupropion and tramadol).

Alcohol: The combination of SSRIs and alcohol is not advisable.

Others: No pharmacodynamic interactions have been noted in clinical studies in which citalopram has been given concomitantly with benzodiazepines, neuroleptics, analgesics, lithium, alcohol, antihistamines, antihypertensive drugs, beta-blockers and other cardiovascular drugs.

Experience with citalopram has not revealed any clinically relevant interactions with neuroleptics with the exception of pimozide (see Contraindications and Interactions with other drugs – pimozide). However, as with other SSRIs, the possibility of a pharmacodynamic interaction cannot be excluded.

4.6 FERTILITY, PREGNANCY AND LACTATION

Effects on fertility
In rats, female fertility was unaffected by oral treatment with citalopram doses which achieved plasma drug concentrations slightly in excess of those expected in humans, but effects on male rat fertility have not been tested with adequate oral doses.

Use in pregnancy – Pregnancy Category C
Reproduction studies performed in rats and rabbits at oral doses of up to 112 and 32 mg/kg, respectively, have revealed no evidence of teratogenic effects. Studies in rats have shown increased postimplantation loss, reduced fetal weight and fetal developmental changes. A no effect oral dose of 56 mg/kg/day was established for fetal development. There are no adequate and well controlled studies in pregnant women. Because animal reproduction studies are not always predictive of human response, this drug should be used during pregnancy only if clearly needed.

Neonates should be observed if maternal use of citalopram had continued into the later stages of pregnancy, particularly into the third trimester. Abrupt discontinuation should be avoided during pregnancy.

Neonates exposed to citalopram, other SSRIs (Selective Serotonin Reuptake Inhibitors), or SNRIs (Serotonin Norepinephrine Reuptake Inhibitors), late in the third trimester have developed complications requiring prolonged hospitalisation, respiratory support, and tube feeding. Such complications can arise immediately upon delivery. Reported clinical findings have included respiratory distress, cyanosis, apnoea, seizures, temperature instability, feeding difficulty, vomiting, hypoglycaemia, hypotonia, hypertonia, hyperreflexia, tremor, jitteriness, irritability, lethargy,
constant crying, somnolence and difficulty sleeping. These features are consistent with either a direct toxic effect of SSRIs and SNRIs or, possibly, a drug discontinuation syndrome.

Epidemiological studies have shown that the use of SSRIs (including citalopram) in pregnancy, particularly use in late pregnancy, was associated with an increased risk of persistent pulmonary hypertension of the newborn (PPHN). The risk of PPHN among infants born to women who used SSRIs late in pregnancy was estimated to be 4 to 5 times higher than the rate of 1 to 2 per 1000 pregnancies observed in the general population.

**Use in lactation.**

Citalopram appears in human breast milk in very low concentrations. In breastfeeding mothers, caution is recommended as it is not known whether citalopram excreted in milk may affect the infant.

### 4.7 Effects on Ability to Drive and Use Machines

Patients who are prescribed psychotropic medication may be expected to have some impairment of general attention and concentration and should be cautioned about their ability to drive a car and operate machinery.

### 4.8 Adverse Effects (Undesirable Effects)

Adverse effects observed with citalopram are in general mild and transient. They are most frequent during the first one or two weeks of treatment and usually attenuate subsequently.

The most commonly observed adverse events associated with the use of citalopram in double blind, placebo controlled trials and not seen at an equal incidence among placebo treated patients were: nausea, somnolence, dry mouth, increased sweating, tremor, diarrhoea and ejaculation disorder. The incidence of each in excess over placebo was low.

In comparative double blind clinical trials with tricyclic and tetracyclic antidepressants (TTCAs), the incidence of ten adverse events was statistically significantly higher on TTCAs (dry mouth, increased sweating, constipation, tremor, dizziness, somnolence, abnormal accommodation, postural hypotension, palpitations, perverted taste) compared to citalopram. For two events (nausea, ejaculation disorder) the incidence was statistically higher on citalopram compared to TTCAs.

In the comparative trials versus other SSRIs no statistically significant differences between the groups were found.

Adverse events reported in clinical trials with citalopram treated patients include those listed in Table 1.
Table 1: Treatment emergent adverse events in >1% in any group of the patients in placebo-controlled trials are also included.

<table>
<thead>
<tr>
<th>System Organ Class Reaction (WHO preferred term)</th>
<th>Citalopram versus placebo</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(n=1,083)</td>
</tr>
<tr>
<td></td>
<td>(F=660; M=423)</td>
</tr>
<tr>
<td>Citalopram (%)</td>
<td>Placebo (%)</td>
</tr>
<tr>
<td>(100) Skin and appendages</td>
<td></td>
</tr>
<tr>
<td>Pruritis</td>
<td>1.0</td>
</tr>
<tr>
<td>Rash</td>
<td>1.0</td>
</tr>
<tr>
<td>Sweating increased</td>
<td>11.3*</td>
</tr>
<tr>
<td>(200) Musculoskeletal system</td>
<td></td>
</tr>
<tr>
<td>Myalgia</td>
<td>1.9</td>
</tr>
<tr>
<td>Arthralgia</td>
<td>1.8</td>
</tr>
<tr>
<td>(410) Central and peripheral nervous system</td>
<td></td>
</tr>
<tr>
<td>Dizziness</td>
<td>10.3</td>
</tr>
<tr>
<td>Extrapyramidal disorder#</td>
<td>1.5</td>
</tr>
<tr>
<td>Headache</td>
<td>26.9</td>
</tr>
<tr>
<td>Parathesia</td>
<td>1.4</td>
</tr>
<tr>
<td>Tremor</td>
<td>8.8*</td>
</tr>
<tr>
<td>(431) Ocular</td>
<td></td>
</tr>
<tr>
<td>Vision abnormal</td>
<td>4.7</td>
</tr>
<tr>
<td>(432) Hearing and vestibular</td>
<td></td>
</tr>
<tr>
<td>Tinnitus</td>
<td>1.0</td>
</tr>
<tr>
<td>(433) Special senses other</td>
<td></td>
</tr>
<tr>
<td>Taste perversion</td>
<td>0.9</td>
</tr>
<tr>
<td>(500) Psychiatric</td>
<td></td>
</tr>
<tr>
<td>Agitation</td>
<td>2.5</td>
</tr>
<tr>
<td>Condition</td>
<td>Value 1</td>
</tr>
<tr>
<td>----------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>Anorexia</td>
<td>4.2</td>
</tr>
<tr>
<td>Anxiety</td>
<td>3.5</td>
</tr>
<tr>
<td>Concentration impaired</td>
<td>1.7</td>
</tr>
<tr>
<td>Confusion</td>
<td>1.4</td>
</tr>
<tr>
<td>Dreaming abnormal</td>
<td>0.8</td>
</tr>
<tr>
<td>Insomnia</td>
<td>18.8</td>
</tr>
<tr>
<td>Libido decreased</td>
<td>2.5</td>
</tr>
<tr>
<td>Nervousness</td>
<td>4.0</td>
</tr>
<tr>
<td>Somnolence</td>
<td>17.9*</td>
</tr>
<tr>
<td>Suicide attempt</td>
<td>1.3</td>
</tr>
<tr>
<td>Yawning</td>
<td>2.0</td>
</tr>
<tr>
<td><strong>(600) Gastrointestinal</strong></td>
<td></td>
</tr>
<tr>
<td>Abdominal pain</td>
<td>3.2</td>
</tr>
<tr>
<td>Constipation</td>
<td>8.4</td>
</tr>
<tr>
<td>Diarrhoea</td>
<td>7.9*</td>
</tr>
<tr>
<td>Dyspepsia</td>
<td>4.5</td>
</tr>
<tr>
<td>Flatulence</td>
<td>1.7</td>
</tr>
<tr>
<td>Dry mouth</td>
<td>20.0*</td>
</tr>
<tr>
<td>Nausea</td>
<td>21.4*</td>
</tr>
<tr>
<td>Vomiting</td>
<td>3.8</td>
</tr>
<tr>
<td><strong>(800) Metabolic and nutritional</strong></td>
<td></td>
</tr>
<tr>
<td>Weight decrease</td>
<td>1.5</td>
</tr>
<tr>
<td><strong>(1030) Heart rate and rhythm</strong></td>
<td></td>
</tr>
<tr>
<td>Palpitation</td>
<td>7.1</td>
</tr>
<tr>
<td><strong>(1100) Respiratory</strong></td>
<td></td>
</tr>
<tr>
<td>Coughing</td>
<td>1.7</td>
</tr>
<tr>
<td>Condition</td>
<td>Frequency 1</td>
</tr>
<tr>
<td>----------------------------------</td>
<td>-------------</td>
</tr>
<tr>
<td>Pharyngitis</td>
<td>3.2</td>
</tr>
<tr>
<td>Rhinitis</td>
<td>4.6</td>
</tr>
<tr>
<td>Sinusitis</td>
<td>2.4</td>
</tr>
<tr>
<td>Upper respiratory tract infection</td>
<td>4.9</td>
</tr>
<tr>
<td><strong>(1300) Urinary system</strong></td>
<td></td>
</tr>
<tr>
<td>Micturition disorder</td>
<td>2.3</td>
</tr>
<tr>
<td><strong>(1410) Reproductive, male</strong></td>
<td></td>
</tr>
<tr>
<td>Ejaculation disorder</td>
<td>5.9*</td>
</tr>
<tr>
<td>Impotence</td>
<td>2.8</td>
</tr>
<tr>
<td><strong>(1420) Reproductive, female</strong></td>
<td></td>
</tr>
<tr>
<td>Menstrual disorder§</td>
<td>4.0</td>
</tr>
<tr>
<td><strong>(1810) Body as a whole</strong></td>
<td></td>
</tr>
<tr>
<td>Asthenia</td>
<td>11.5</td>
</tr>
<tr>
<td>Back pain</td>
<td>2.0</td>
</tr>
<tr>
<td>Chest pain</td>
<td>1.2</td>
</tr>
<tr>
<td>Fatigue</td>
<td>4.9</td>
</tr>
<tr>
<td>Fever</td>
<td>2.3</td>
</tr>
<tr>
<td>Influenza-like symptoms</td>
<td>1.0</td>
</tr>
<tr>
<td>Pain</td>
<td>1.3</td>
</tr>
</tbody>
</table>

For adverse events with a frequency ≥5%, * indicates statistically significant difference between the groups (p<0.05).

# including dyskinesia, dystonia, hyperkinesia, hypertonia, hypokinesia.

§ CT≤50 years: n=447; PL ≤ 50 years: n = 180

Dose dependency of adverse events: The potential relationship between the dose of citalopram administered and the incidence of adverse events was examined in a fixed dose study in depressed patients receiving placebo or citalopram 10, 20, 40 and 60 mg. Jonckheere's trend test revealed a positive dose response (p < 0.05) for the following adverse events: fatigue, impotence, insomnia, increased sweating, somnolence and yawning.
Male and female sexual dysfunction with SSRIs: While sexual dysfunction is often part of depression and other psychiatric disorders, there is increasing evidence that treatment with selective serotonin reuptake inhibitors (SSRIs) may induce sexual side effects. This is a difficult area to study because patients may not spontaneously report symptoms of this nature, and therefore it is thought that sexual side effects with the SSRIs may be underestimated. In placebo controlled clinical trials (see Table 1), the reported incidence of decreased libido for the whole population was 2.5%; ejaculation disorder (primarily ejaculatory delay) and impotence in male depressed patients receiving citalopram (n = 423) was 5.9% and 2.8%, respectively. In female depressed patients receiving citalopram (n = 660), the reported incidence of anorgasmia was 0.5%. The reported incidence of decreased libido was 0.4% among depressed patients receiving placebo, whilst sex specific adverse events were not reported among male and female depressed patients receiving placebo.

While it is difficult to know the precise risk of sexual dysfunction associated with the use of SSRIs, doctors should routinely inquire about such possible side effects.

Vital sign changes: Citalopram and placebo groups were compared with respect to (1) mean change from baseline in vital signs (pulse, systolic blood pressure and diastolic blood pressure) and (2) the incidence of patients meeting criteria for potentially clinically significant changes from baseline in these variables. These analyses did not reveal any clinically important changes in vital signs associated with citalopram treatment. In addition, a comparison of supine and standing vital sign measures for citalopram and placebo treatments indicated that citalopram treatment is not associated with orthostatic changes.

Weight changes:

Patients treated with citalopram in controlled trials experienced a weight loss of about 0.5 kg compared to no change for placebo patients.

Laboratory changes:

Citalopram and placebo groups were compared with respect to (1) mean change from baseline in various serum chemistry, haematology and urinalysis variables and (2) the incidence of patients meeting criteria for potentially clinically significant changes from baseline in these variables. These analyses revealed no clinically important changes in laboratory test parameters associated with citalopram treatment.

ECG changes:

Electrocardiograms from citalopram (n=802) and placebo (n=241) groups were compared with respect to outliers defined as subjects with QTc changes over 60 msec from baseline or absolute values over 500 msec post-dose, and subjects with heart rate increases to over 100 bpm or decreases to less than 50 bpm with a 25% change from baseline (tachycardic or bradycardic outliers respectively). In the citalopram group 1.9% of the patients had a change from baseline in QTcF>60 msec compared to 1.2% of the patients in the placebo group. None of the patients in the placebo group had a post-dose QTcF>500 msec compared to 0.5% of the patients in the citalopram group. The incidence of tachycardic outliers was 0.5% in the citalopram group and 0.4% in the placebo group. The incidence of bradycardic outliers was 0.9% in the citalopram group and 0.4% in the placebo group.
In a thorough QT study, citalopram was found to be associated with a dose dependent increase in the QTc interval (see section 4.4 SPECIAL WARNINGS AND PRECAUTIONS FOR USE – QT Prolongation and Tosade de Pointes).

**Other events observed during the premarketing evaluation of citalopram:**

Following is a list of WHO terms that reflect treatment emergent adverse events, as defined in the introduction to the Adverse Effects, reported by patients treated with citalopram at multiple doses in a range of 10 to 80 mg/day during any phase of a trial within the premarketing database of 4,422 patients. All reported events are included except those already listed in Table 1 or elsewhere in Adverse Effects, those events for which a drug cause was remote, those event terms which were so general as to be uninformative and those occurring in only one patient. It is important to emphasise that, although the events reported occurred during treatment with citalopram, they were not necessarily caused by it.

Events are further categorised by body system and listed in order of decreasing frequency according to the following definitions: very common adverse events are those occurring on one or more occasions in at least 1/10 patients; common adverse events are those occurring in less than 1/10 but at least 1/100; uncommon adverse events are those occurring in less than 1/100 patients but at least 1/1,000 patients; rare events are those occurring in fewer than 1/1,000 patients; unknown cannot be estimated from available data.

**Skin and appendages:**

- **Uncommon:** photosensitivity reaction, urticaria, acne, eczema, skin discolouration, alopecia, dermatitis, dry skin, psoriasis, rash.
- **Rare:** hypertrichosis, decreased sweating, melanosis, keratitis, pruritus ani.
- **Unknown:** ecchymosis, angioedema.

**Musculoskeletal system:**

- **Uncommon:** arthritis, muscle weakness, skeletal pain.
- **Rare:** bursitis, osteoporosis.

**Central and peripheral nervous system:**

- **Common:** migraine.
- **Uncommon:** vertigo, leg cramps, involuntary muscle contractions, speech disorder, abnormal gait, hypoesthesia, neuralgia, ataxia, convulsions.
- **Rare:** abnormal coordination, hyperaesthesia, ptosis, stupor.

**Vision disorders:**

- **Common:** abnormal accommodation.
- **Uncommon:** conjunctivitis, eye pain.
Rare: mydriasis, photophobia, abnormal lacrimation, cataract, diplopia.

Unknown: visual disturbance.

**Special senses:**

Common: taste perversion.

Rare: taste loss.

**Psychiatric:**

Common: amnesia, apathy, depression, increased appetite, aggravated depression.

Uncommon: aggressive reaction, increased libido, paroniria, drug dependence, depersonalisation, hallucination, euphoria, psychotic depression, delusion, paranoid reaction, emotional lability, panic reaction, psychosis, mania.

Rare: catatonic reaction, melancholia, suicide related events.

Unknown: bruxism, restlessness.

**Gastrointestinal:**

Common: increased saliva.

Uncommon: gastritis, gastroenteritis, eructation, haemorrhoids, dysphagia, gingivitis, stomatitis, teeth grinding, oesophagitis.

Rare: colitis, gastric ulcer, duodenal ulcer, gastro-oesophageal reflux, diverticulitis, glossitis, hiccups, rectal haemorrhage.

Unknown: gastrointestinal haemorrhage.

**Immune system:**

Unknown: anaphylactic reaction, hypersensitivity not otherwise specified (NOS).

**Liver and biliary system:**

Uncommon: increased ALT, increased gamma-GT, increased AST.

Rare: cholecystitis, cholelithiasis, bilirubinaemia, jaundice, hepatitis.

Unknown: liver function test abnormal.

**Metabolic and nutritional:**

Common: increased weight, decreased weight.

Uncommon: thirst, dry eyes, increased alkaline phosphatase, abnormal glucose tolerance.

Rare: hypokalaemia, obesity, hypoglycaemia, dehydration.
**Endocrine:**
Rare: hypothyroidism, goitre, gynaecomastia.

**General cardiovascular:**
Common: postural hypotension, hypotension.
Uncommon: hypertension, oedema (extremities), cardiac failure, bradycardia, tachycardia.
Unknown: orthostatic hypotension.

**Myocardial, endocardial, pericardial and valve disorders:**
Uncommon: angina pectoris, myocardial infarction, myocardial ischaemia.

**Heart rate and rhythm disorders:**
Common: tachycardia.
Uncommon: bradycardia, extrasystoles, atrial fibrillation.
Rare: bundle branch block, cardiac arrest, QT prolongation, Torsade de Pointes.

**Vascular (extracardiac) disorders:**
Uncommon: cerebrovascular accident, flushing, transient ischaemic attack.
Rare: phlebitis.

**Respiratory:**
Uncommon: bronchitis, dyspnoea, pneumonia.
Rare: asthma, laryngitis, bronchospasm, pneumonitis, increased sputum.

**Red blood cell disorders:**
Uncommon: anaemia.
Rare: hypochromic anaemia.

**White cell and reticuloendothelial disorders:**
Uncommon: leucopenia, leucocytosis, lymphadenopathy.
Rare: granulocytopenia, lymphocytosis, lymphopenia.

**Platelet, bleeding & clotting disorders:**
Uncommon: abnormal bleeding, predominantly of the skin and mucous membranes, including purpura, epistaxis, haematomas, vaginal bleeding and gastrointestinal bleeding.
Rare: altered platelet function, haematuria, leukopenia, increased coagulation times, pulmonary embolism, coagulation disorder, gingival bleeding.
Unknown: thrombocytopenia.

**Urinary tract disorders:**

Common: polyuria.

Uncommon: micturition frequency, urinary incontinence, urinary retention, dysuria.

Rare: facial oedema, haematuria, oliguria, pyelonephritis, renal calculus, renal pain.

**Female reproductive disorders:**

Common: amenorrhoea.

Uncommon: nonpuerperal lactation, breast pain, breast enlargement, vaginal haemorrhage, menorrhagia.

Unknown: metrorrhagia.

**Male reproductive system and breast disorders:**

Unknown: priapism, galactorrhoea.

**Body as a whole:**

Uncommon: hot flushes, rigors, alcohol intolerance, syncope.

Rare: hay fever.

**Other events observed during the postmarketing evaluation of citalopram:**

Although no causal relationship to citalopram treatment has been found, the following adverse events have been reported to be temporally associated with citalopram treatment in at least three patients (unless otherwise noted) and not described elsewhere in Adverse Effects (total of 8 million patients estimated to have been treated with citalopram): angioedema, choreoathetosis, epidermal necrolysis (three cases), erythema multiforme, hepatic necrosis (two cases), hepatitis, cholestatic hepatitis, hyponatraemia, neuroleptic malignant syndrome, mania, pancreatitis, serotonin syndrome, spontaneous abortion, thrombocytopenia, ventricular arrhythmia, priapism and withdrawal syndrome.

Akathisia has been reported very rarely (<1/10,000).

Cases of QT prolongation have been reported during the postmarketing period, predominantly in patients with pre-existing cardiac disease.
Class effect:

Epidemiological studies, mainly conducted in patients 50 years of age and older, show an increased risk of bone fractures in patients receiving SSRIs and TCAs. The mechanism leading to this is unknown.

Reporting suspected adverse effects

Reporting suspected adverse reactions after registration 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 at www.tga.gov.au/reporting-problems.

4.9 OVERDOSE

In general, the main therapy for all overdoses is supportive and symptomatic care.

Citalopram is given to depressed patients who are at potential risk of suicide. Some reports of attempted suicide in citalopram treated patients have been received. Detail is often lacking regarding precise dose or combination with other drugs and/or alcohol.

Symptoms:

The following symptoms have been observed in reported overdose of citalopram: convulsion, tachycardia, somnolence, QT prolongation, coma, vomiting, tremor, hypotension, cardiac arrest, nausea, serotonin syndrome, agitation, bradycardia, dizziness, bundle branch block, QRS prolongation, hypertension, mydriasis, nodal rhythm, ventricular arrhythmia, and very rare cases of Torsade de Pointes.

Treatment:

There is no specific antidote. Treatment is symptomatic and supportive. The use of activated charcoal should be considered. Activated charcoal may reduce absorption of the drug if given within one or two hours after ingestion. In patients who are not fully conscious or have impaired gag reflex, consideration should be given to administering activated charcoal via a nasogastric tube, once the airway is protected. Medical surveillance is advisable. Medical surveillance is advisable. ECG monitoring is recommended when more than 600 mg have been ingested. Convulsions may be treated with diazepam.

Elimination half-life ($T_{1/2}$) and $T_{max}$ are independent of the dose taken. Information on these pharmacokinetic parameters can be found under Pharmacology.

For information on the management of overdose, contact the Poisons Information Centre on 13 11 26 (Australia).
5 PHARMACOLOGICAL PROPERTIES

5.1 PHARMACODYNAMIC PROPERTIES

Mechanism of action

Biochemical and behavioural studies have shown that citalopram is a potent inhibitor of serotonin (5-hydroxytryptamine (5HT)) uptake. Tolerance to the inhibition of SHT uptake is not induced by long-term treatment with citalopram.

On the basis of in vitro studies, citalopram is one of the most selective serotonin reuptake inhibitor (SSRI) yet developed, with no or minimal effect on noradrenaline, dopamine (DA) and gamma-aminobutyric acid (GABA) uptake. In comparison with other SSRIs the decreasing order of selectivity is escitalopram, citalopram, sertraline, paroxetine, fluvoxamine and fluoxetine. The clinical relevance of this in vitro finding has not been established.

In contrast to many tricyclic antidepressants and some of the newer SSRIs, citalopram has no or very low affinity for a series of receptors including 5HT1A, 5HT2, DA D1 and DA D2 receptors, alpha1 receptors, alpha2 receptors, beta-adrenoceptors, histamine H1, muscarine cholinergic, benzodiazepine, and opioid receptors. A series of functional in vitro tests in isolated organs as well as functional in vivo tests have confirmed the lack of receptor affinity.

Suppression of rapid eye movement (REM) sleep is considered a predictor of antidepressant activity. Like tricyclic antidepressants, other SSRIs and monoamine oxidase inhibitors (MAOIs), citalopram suppresses REM sleep and increases deep slow wave sleep (based upon a five week single blind study in 16 depressed patients given doses up to 40 mg daily).

Although citalopram does not bind to opioid receptors, it potentiates the anti-nociceptive effect of commonly used opioid analgesics in rats. The clinical significance of this finding has not been established.

The main metabolites of citalopram are all SSRIs although their potency and selectivity ratios are lower than those of citalopram but higher than those of many of the newer SSRIs. The metabolites do not contribute to the overall antidepressant effect.

In humans, citalopram does not impair cognitive function or psychomotor performance to the same extent as amitriptyline and it has slight sedative properties. There were results suggestive of impairment in some tests (critical flicker fusion, coding skills, body sway, immediate memory recall).

Citalopram did not reduce saliva flow in a single dose study in human volunteers and in none of the studies in healthy volunteers did citalopram have significant influence on cardiovascular parameters. Citalopram has no effect on the serum levels of growth hormone. Like other SSRIs, citalopram increases plasma prolactin, an effect secondary to the prolactin stimulating role of serotonin.

Clinical trials

Citalopram in the dose range 20 to 80 mg/day is more effective than placebo in the treatment of depression in the majority of trials, including relapse prevention trials. In the double blind, placebo controlled trials a total of 1,083 patients received citalopram and 486 received placebo. There were three fixed dose trials of six weeks duration. In one trial a total of 650 patients with major
depression were randomly allocated in approximately equal groups (approx. 130 per group) to receive placebo or 10 mg, 20 mg, 40 mg or 60 mg citalopram. In the other two fixed dose studies, placebo was compared with 20 mg or 40 mg citalopram. Between 88 and 97 patients were treated in each group in one trial and approximately 48 in each group in the other. The remaining five trials of four or six weeks duration used flexible doses in the range of 20 to 80 mg/day.

In two relapse prevention or maintenance studies of 24 weeks duration, 257 patients were treated with citalopram and 116 with placebo. In one study, 147 citalopram treated patients who were responders (Montgomery-Asbury Depression Rating Scale (MADRS) less than or equal to 12) in two six week fixed dose studies were re-randomised to receive placebo (n = 42) or continue their previous treatment with citalopram 20 mg (n = 48) or 40 mg (n = 57). In the other study MADRS responders (score less than or equal to 12) continued from an open eight week trial and were randomised to receive placebo (n = 74) or continue with their optimal dose of citalopram (range 20 to 60 mg daily, n = 152). In both studies citalopram, independent of dose, reduced relapse rates and prolonged time to relapse compared to placebo.

The majority of the patients in the placebo controlled trials received 40 mg/day. The minimal effective dose was 20 mg/day. Analyses of subgroups of patients showed that patients experiencing their first episode of depression or with less severe depression responded well to the minimal effective dose of 20 mg while patients suffering from severe or recurrent depression achieved better results with 40 or 60 mg/day.

Citalopram demonstrates an equivalent therapeutic efficacy to tricyclic and tetracyclic antidepressants and other SSRIs in the treatment of major depression. The active comparator studies were chiefly randomised double blind studies. In the trials versus tricyclic and tetracyclic antidepressants (TTCA), a total of 682 patients received citalopram and 389 TTCAs. In the comparative trials versus other SSRIs, there were 439 citalopram treated patients and 451 treated with other SSRIs. In the six week comparison to imipramine, doses of citalopram 20 to 30 mg (n = 187) and 40 to 60 mg (n = 193) were equally effective as imipramine 100 to 150 mg (n = 92). In an eight week comparison carried out in hospital settings with fixed doses, citalopram 40 mg (n = 158) was equally effective to fluoxetine 20 mg (n = 158). Likewise in a general practice study, citalopram 20 mg (n = 173) was equally effective to fluoxetine 20 mg (n = 184). A six week comparison to fluvoxamine in flexible doses (citalopram 20 to 40 mg (n = 108)/fluvoxamine 100 to 200 mg (n = 109) also demonstrated equal efficacy.

5.2 PHARMACOKINETIC PROPERTIES

Absorption

Oral bioavailability is about 80% and is independent of food intake (T_{max} mean 3.8 hours). The bioavailability of each enantiomer has not been studied separately, but the pharmacokinetics of each enantiomer is different.

Distribution

The apparent volume of distribution (V_{d})_{beta} is about 12 to 17 L/kg. The plasma protein binding is below 80% for citalopram and its main metabolites. After six weeks on 40 to 60 mg/day in ten patients, the mean serum concentration of S-(+)-citalopram was about 50% of the R-(−)-citalopram
concentration and the mean serum concentration of R-(-)-demethylcitalopram (DCIT) was 1.5 times that of S-(+)-DCIT.

**Metabolism**

Citalopram is metabolised to the active demethylcitalopram (DCIT), didemethylcitalopram, citalopram-N-oxide and an inactive deaminated propionic acid derivative. All the active metabolites are also SSRIs, although weaker than the parent compound. Unchanged citalopram is the predominant compound in plasma.

**Excretion**

The elimination half-life ($t_{1/2\beta}$) is about 1.5 days and the systemic citalopram plasma clearance is about 0.3 to 0.4 L/minute, and total (oral) plasma clearance is about 0.4 L/minute.

About 12 to 23% of the daily dose is excreted unchanged in the urine. Hepatic (residual) clearance is about 0.3 L/minute and renal clearance about 0.05 to 0.08 L/minute.

The kinetics are linear. Steady-state plasma levels are achieved in one to two weeks. Average concentrations of 250 nanomol/L (100 to 500 nanomol/L) are achieved at a daily dose of 40 mg. There was no clear relationship between citalopram plasma levels and therapeutic response or side effects in a study of 650 patients.

**Elderly patients (> 65 years):** Longer half-lives and decreased clearance values due to a reduced rate of metabolism have been demonstrated in elderly patients.

**Reduced hepatic function:** Citalopram is eliminated more slowly in patients with reduced hepatic function. The half-life of citalopram is about twice as long and steady-state citalopram concentrations at a given dose will be about twice as high as in patients with normal liver function.

**Polymorphism:** There was no clinically relevant difference in the AUC between poor and extensive metabolisers with respect to CYP2D6 following administration of citalopram. The AUC for poor metabolisers with respect to CYP2C19 was less than 2-fold higher than the AUC observed in the extensive metabolisers (see section 4.2 DOSE AND METHOD OF ADMINISTRATION).

**Reduced renal function:** Citalopram is eliminated more slowly in patients with mild to moderate reduction of renal function, without major impact on the pharmacokinetics of citalopram.

**5.3 Preclinical safety data**

**Genotoxicity**

In assays of genotoxic activity, citalopram showed no evidence of mutagenic or clastogenic activity.

**Carcinogenicity**

Citalopram did not show any carcinogenic activity in long-term oral studies using mice and rats at doses up to 240 and 80 mg/kg/day, respectively.
6 PHARMACEUTICAL PARTICULARS

6.1 LIST OF EXCIPIENTS

The 20mg tablets contain the following excipients: lactose monohydrate, microcrystalline cellulose, maize starch, povidone, crospovidone, magnesium stearate and Opadry White complete film coating system Y-1-7000.

The 10mg & 40mg tablets contain the following excipients: lactose monohydrate, pregelatinised maize starch, maize starch, purified water, microcrystalline cellulose, croscarmellose sodium, magnesium stearate, hypromellose, titanium dioxide, purified talc and macrogol 400.

The tablets are gluten free.

6.2 INCOMPATIBILITIES

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

6.3 SHELF LIFE

In Australia, information on the shelf life can be found on the public summary of the Australian Register of Therapeutic Goods (ARTG). The expiry date can be found on the packaging.

6.4 SPECIAL PRECAUTIONS FOR STORAGE

Store the tablets below 25°C.

6.5 NATURE AND CONTENTS OF CONTAINER

20 mg: blister packs (PVC/PVDC/Al) and bottles (HDPE bottle with PP child resistant closure) of 28’s.

10mg* & 40 mg*: blister pack (PVC/PVDC/Al) of 28’s, 56*, 7*, 84*, and 14*

* not marketed

6.6 SPECIAL PRECAUTIONS FOR DISPOSAL

In Australia, any unused medicine or waste material should be disposed of by taking to your local pharmacy.

6.7 PHYSICOCHEMICAL PROPERTIES

Chemical structure

Citalopram hydrobromide is a fine white to off-white, crystalline powder, present in Talam as a racemate. It is sparingly soluble in water, soluble in ethanol (96%), freely soluble in chloroform and very slightly soluble in diethylether. No polymorphic forms have been detected.

Citalopram hydrobromide. The chemical name for citalopram hydrobromide is (±)-1-[3-(dimethyl amino)propyl]-1-(4-fluorophenyl)-1,3-dihydroisobenzofuran-5-carbonitrile hydrobromide. Its structural formula is:
C\textsubscript{20}H\textsubscript{21}FN\textsubscript{2}O,HBr Molecular weight: 405.3

**CAS number**
59729-32-7

**7 MEDICINE SCHEDULE (POISONS STANDARD)**
Schedule 4 - Prescription Only Medicine

**8 SPONSOR**
Arrow Pharma Pty Ltd
15-17 Chapel Street
Cremorne VIC 3121
www.arrowpharma.com.au

**9 DATE OF FIRST APPROVAL**
10 February 2003

**10 DATE OF REVISION**
15 October 2018

**Summary table of changes**

<table>
<thead>
<tr>
<th>Section Changed</th>
<th>Summary of new information</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
