Clozaril® can cause agranulocytosis. Its use should be limited to patients:

- with schizophrenia who are non-responsive to or intolerant of classical antipsychotic agents, or with schizophrenia or schizoaffective disorder who are at risk of recurrent suicidal behaviour (see section 4.1),
- who have initially normal leukocyte findings (white blood cell count (WBC) ≥ 3500/mm$^3$ (3.5 x $10^9$/L), and absolute neutrophil counts (ANC) ≥ 2000/mm$^3$ (2.0 x $10^9$/L)),
- and in whom regular white blood cell counts and absolute neutrophil counts can be performed as follows: weekly during the first 18 weeks of therapy, and at least every 4 weeks thereafter throughout treatment. Monitoring must continue throughout treatment and for 4 weeks after complete discontinuation of Clozaril.

Prescribing physicians should comply fully with the required safety measures. At each consultation, a patient receiving Clozaril should be reminded to contact the treating physician immediately if any kind of infection begins to develop. Particular attention should be paid to flu-like complaints such as fever or sore throat and to other evidence of infection, which may be indicative of neutropenia.

Clozaril must be dispensed in accordance with appropriate local dispensing guidelines. The following conditions apply to the sale, supply and use of Clozaril in New Zealand under the consent notice from Medsafe. Mylan New Zealand Ltd draws prescribers, nurses and patients attention to the following criteria:

Clozapine may only be prescribed by:

- Registered medical practitioners as defined in the Health Practitioners Competence Assurance Act 2003 who are certified by the Medical Council of New Zealand as competent in the scope of practice of psychiatry;
- Medical practitioners employed as registrars in the branch of psychiatry who are under the supervision of the persons referred to above;
- Medical officers who:
  - are in the employment of a District Health Board; and
  - are under the supervision of persons who are registered medical practitioners as defined in the Health Practitioners Competence Assurance Act 2003 who are certified by the Medical Council of New Zealand as competent in the scope of practice of psychiatry.
  - Registered medical practitioners as defined in the Health Practitioners Competence Assurance Act 2003 who are registered with the Medical Council of New Zealand within the vocational scope of practice of general practice. The general practitioner must be continuing the prescribing of clozapine for a specific patient whose illness is well-controlled in collaboration, or following consultation, with a Community Mental Health Team.

Persons prescribing clozapine must comply with appropriate local treatment guidelines. The medicine must be dispensed in accordance with appropriate local dispensing guidelines. Brand swapping between clozapine products is discouraged and should occur on the advice of a clinician.

Prescribers and dispensers should verify that the patient has not previously developed an adverse reaction to clozapine that contraindicates further use of any clozapine containing product.

Clozapine is associated with an increased risk of myocarditis which has, in rare cases, been fatal. The increased risk of myocarditis is greatest in the first two months of treatment. Fatal cases of cardiomyopathy have also been reported rarely. Myocarditis and cardiomyopathy should be suspected in patients who experience persistent tachycardia at rest especially in the first two months of treatment and/or palpitations, arrhythmias, chest pain and other signs and symptoms of heart failure (e.g. unexplained fatigue, dyspnoea, tachypnoea) or symptoms that mimic myocardial infarction. If myocarditis or cardiomyopathy is suspected, Clozaril treatment should promptly be stopped and the patient immediately referred to a cardiologist.
1. Product Name
CLOZARIL, 25 mg and 100 mg dose tablets.

2. Qualitative and Quantitative Composition
Each tablet contains 25 mg or 100 mg of clozapine.
CLOZARIL tablets contain lactose. For the full list of excipients, see section 6.1.

3. Pharmaceutical Form
Clozaril 25mg tablets are light yellowish round, flat with bevelled edges, scored with markings LO on one side, SANDOZ on the other and 6.3 mm diameter.

Clozaril 100mg tablets are light yellowish round, flat with bevelled edges scored with markings ZA on one side, SANDOZ on the other and 10 mm diameter.

4. Clinical Particulars

4.1 Therapeutic indications
Treatment-resistant schizophrenia
Clozaril is indicated in adult patients with treatment-resistant schizophrenia, i.e. patients with schizophrenia who are non-responsive to or intolerant of classic antipsychotics.

Non-responsiveness is defined as a lack of satisfactory clinical improvement despite the use of adequate doses of at least two marketed antipsychotics prescribed for adequate durations.

Intolerance is defined as the impossibility of achieving adequate clinical benefit with classic antipsychotics because of severe and untreatable neurological adverse reactions (extrapyramidal side effects or tardive dyskinesia).

4.2 Dose and method of administration
Dose
The dosage must be adjusted individually. For each patient the lowest effective dose should be used. Cautious titration and a divided dosage schedule are necessary to minimize the risks of hypotension, seizure, and sedation.

Initiation of Clozaril treatment must be restricted to those patients with a white blood cell (WBC) count $\geq 3500/mm^3$ (3.5 x 10^9/L) and an absolute neutrophil count (ANC) $\geq 2000/mm^3$ (2.0 x 10^9/L), and within standardised normal limits.

Dose adjustment is indicated in patients who are also receiving medicinal products that have pharmacokinetic interactions with clozapine, such as benzodiazepines or selective serotonin re-uptake inhibitors (see section 4.5).

In patients with a history of seizures or suffering from renal or cardiovascular disorders (note: severe renal or cardiovascular disorders are contraindications) the initial dose should be 12.5 mg given once on the first day, and dosage increase should be slow and in small increments.
Switching from a previous antipsychotic therapy to Clozaril

It is generally recommended that Clozaril should not be used in combination with other antipsychotics. When Clozaril therapy is to be initiated in a patient undergoing oral antipsychotic therapy, it is recommended that the dosage of other antipsychotics be reduced or discontinued by gradually tapering it downwards. Based on the clinical circumstances, the prescribing physician should judge whether or not to discontinue the other antipsychotic therapy before initiating treatment with Clozaril.

Treatment-resistant schizophrenia

Starting therapy

Clozaril should be started with 12.5 mg (half a 25 mg tablet) once or twice on the first day, followed by one or two 25 mg tablets on the second day. If well tolerated, the daily dose may then be increased slowly in increments of 25 mg to 50 mg in order to achieve a dose level of up to 300 mg/day within 2 to 3 weeks. Thereafter, if required, the daily dose may be further increased in increments of 50 mg to 100 mg at half-weekly or, preferably, weekly intervals.

Therapeutic dose range

In most patients, antipsychotic efficacy can be expected with 300 to 450 mg/day given in divided doses. Some patients may be treated with lower doses, and some patients may require doses up to 600 mg/day. The total daily dose may be divided unevenly, with the larger portion being taken at bedtime.

Maximum dose

To obtain full therapeutic benefit, a few patients may require larger doses, in which case judicious increments (not exceeding 100 mg) are permissible up to 900 mg/day. The possibility of increased adverse reactions (in particular seizures) occurring at doses over 450 mg/day must be borne in mind.

Maintenance dose

After achieving maximum therapeutic benefit, many patients can be maintained effectively on lower doses. Careful downward titration is therefore recommended. Treatment should be maintained for at least 6 months. If the daily dose does not exceed 200 mg, once daily administration in the evening may be appropriate.

Ending therapy

In the event of planned termination of Clozaril therapy, a gradual reduction in dose over a 1- to 2-week period is recommended. If abrupt discontinuation is necessary (e.g. because of leucopenia), the patient should be carefully observed for the recurrence of psychotic symptoms and symptoms related to cholinergic rebound (see section 4.4).

Re-starting therapy

In patients in whom the interval since the last dose of Clozaril exceeds 2 days, treatment should be re-initiated with 12.5 mg (half a 25 mg tablet) given once or twice on the first day. If this dose is well tolerated, it may be feasible to titrate the dose to the therapeutic level more quickly than is recommended for initial treatment. However, in any patient who has previously experienced respiratory or cardiac arrest with initial dosing (see section 4.4), but was then able to be successfully titrated to a therapeutic dose, re-titration should be done with extreme caution.

Special populations

Cardiovascular disorders

In patients suffering from cardiovascular disorders (note: severe cardiovascular disorders are contraindications) the initial dose should be 12.5 mg given once on the first day, and dosage increase should be slow and in small increments.
Renal impairment
In patients with mild to moderate renal impairment the initial dose should be 12.5 mg given once on the first day, and dosage increase should be slow and in small increments.

Hepatic impairment
Patients with hepatic impairment should receive Clozaril with caution along with regular monitoring of liver function tests (see section 4.4).

Paediatrics
No paediatric studies have been performed.

Children and adolescents
The safety and efficacy of Clozaril in children and adolescents have not been established.

Patients of 60 years of age and older
It is recommended that treatment in patients 60 years and older is initiated at a particularly low dose (12.5 mg given once on the first day) with subsequent dose increments restricted to 25 mg/day.

Method of administration
Clozaril is administered orally.

4.3 Contraindications
- Known hypersensitivity to clozapine or to any of the excipients of Clozaril.
- Patients unable to undergo regular blood tests.
- History of toxic or idiosyncratic granulocytopenia/agranulocytosis (with the exception of granulocytopenia/agranulocytosis from previous chemotherapy).
- Impaired bone marrow function.
- Uncontrolled epilepsy.
- Alcoholic and other toxic psychoses, drug intoxication, comatose conditions.
- Circulatory collapse and/or CNS depression of any cause.
- Severe renal or cardiac disorders (e.g. myocarditis).
- Active liver disease associated with nausea, anorexia or jaundice; progressive liver disease, hepatic failure.
- Paralytic ileus.

4.4 Special warnings and precautions for use
Agranulocytosis
Prescribers and dispensers should verify that the patient has not previously developed an adverse reaction to clozapine that contraindicates further use of any clozapine containing product.

Because of the association of Clozaril with agranulocytosis, the following precautionary measures are mandatory:

Drugs known to have a substantial potential to depress bone marrow function should not be used concurrently with Clozaril. In addition, the concomitant use of long-acting depot antipsychotics should be avoided because of the impossibility of removing these medications, which may be potentially myelosuppressive, from the body rapidly in situations where this may be required, e.g. granulocytopenia.

Patients with a history of primary bone marrow disorders may be treated only if the benefit outweighs the risk. They should be carefully reviewed by a haematologist prior to starting Clozaril.
Patients who have low white blood cell (WBC) counts because of benign ethnic neutropenia should be given special consideration and may be started on Clozaril after agreement of a haematologist.

**White Blood Cell (WBC) counts and Absolute Neutrophil Count (ANC) monitoring**

White blood cell (WBC) and differential blood counts must be performed within 10 days prior to starting Clozaril treatment to ensure that only patients with normal leukocyte and absolute neutrophil counts (WBC $\geq 3500/mm^3$ ($\geq 3.5 \times 10^9/L$) and ANC $\geq 2000/mm^3$ ($\geq 2.0 \times 10^9/L$)) will receive Clozaril. After the start of Clozaril treatment, regular WBC count and ANC must be performed and monitored weekly for 18 weeks, and thereafter at least every four weeks throughout treatment, and for 4 weeks after complete discontinuation of Clozaril.

Prescribing physicians should comply fully with the required safety measures. At each consultation, the patient should be reminded to contact the treating physician immediately if any kind of infection begins to develop. Particular attention should be paid to flu-like complaints such as fever, or sore throat and to other evidence of infection, which may be indicative of neutropenia. A differential blood count must be performed immediately if any symptoms or signs of an infection occur.

**Low WBC count and/or ANC**

If during the first 18 weeks of Clozaril therapy, the WBC count falls to between 3500/mm$^3$ (3.5 x $10^9/L$) and 3000/mm$^3$ (3.0 x $10^9/L$) and/or the ANC falls to between 2000/mm$^3$ (2.0 x $10^9/L$) and 1500/mm$^3$ (1.5 x $10^9/L$), haematological evaluations must be performed at least twice weekly.

After 18 weeks of Clozaril therapy, haematological evaluations should be performed at least twice weekly if the WBC count falls to between 3000/mm$^3$ (3.0 x $10^9/L$) and 2500/mm$^3$ (2.5 x $10^9/L$) and/or the ANC falls to between 1500/mm$^3$ (1.5 x $10^9/L$) and 1000/mm$^3$ (1.0 x $10^9/L$). In addition, if, during Clozaril therapy, the WBC count is found to have dropped by a substantial amount from baseline, a repeat WBC count and a differential blood count should be performed. A substantial drop is defined as a single drop of 3000 mm$^3$ (3.0 x $10^9/L$) or more in the WBC count or a cumulative drop of 3000 mm$^3$ (3.0 x $10^9/L$) or more within three weeks.

Immediate discontinuation of Clozaril is mandatory if the WBC count is less than 3000/mm$^3$ (3.0 x $10^9/L$) or the ANC is less than 1500/mm$^3$ (1.5 x $10^9/L$) during the first 18 weeks of therapy, or if the WBC count is less than 2500/mm$^3$ (2.5 x $10^9/L$) or the ANC is less than 1000/mm$^3$ (1.0 x $10^9/L$) after the first 18 weeks of therapy. WBC counts and differential blood counts should then be performed daily and patients should be carefully monitored for flu-like symptoms or other symptoms suggestive of infection. Following discontinuation of Clozaril, haematological evaluation is required until haematological recovery has occurred.

If Clozaril has been withdrawn and WBC count falls further to below 2000/mm$^3$ (2.0 x $10^9/L$) and/or the ANC falls below 1000/mm$^3$ (1.0 x $10^9/L$), the management of this condition must be guided by an experienced haematologist. If possible, the patient should be referred to a specialised haematological unit, where protective isolation and the administration of GM-CSF (granulocyte-macrophage colony stimulating factor) or G-CSF (granulocyte colony stimulating factor) may be indicated. It is recommended that the colony stimulating factor therapy be discontinued when the neutrophil count has returned to a level above 1000/mm$^3$ (1.0 x $10^9/L$).

Patients in whom Clozaril has been discontinued as a result of white blood cell deficiencies (see above) must not be re-exposed to Clozaril.

It is recommended that the haematological values be confirmed by performing two blood counts on two consecutive days; however, Clozaril should be discontinued after the first blood count.
### Table 1  Blood monitoring during the first 18 weeks of Clozaril therapy

<table>
<thead>
<tr>
<th>Blood cell count</th>
<th>Action required</th>
</tr>
</thead>
<tbody>
<tr>
<td>WBC/mm³ (/L)</td>
<td>ANC/mm³ (/L)</td>
</tr>
<tr>
<td>≥ 3500 (≥ 3.5 x 10⁹)</td>
<td>≥ 2000 (≥ 2.0 x 10⁹)</td>
</tr>
<tr>
<td>Between 3000 and 3500 (3.0 x 10⁹-3.5 x 10⁹)</td>
<td>Between 1500 and 2000 (1.5 x 10⁹-2.0 x 10⁹)</td>
</tr>
<tr>
<td>≤ 3000 (≤ 3.0 x 10⁹)</td>
<td>≤ 1500 (≤ 1.5 x 10⁹)</td>
</tr>
</tbody>
</table>

### Table 2  Blood monitoring after 18 weeks of Clozaril therapy

<table>
<thead>
<tr>
<th>Blood cell count</th>
<th>Action required</th>
</tr>
</thead>
<tbody>
<tr>
<td>WBC/mm³ (/L)</td>
<td>ANC/mm³ (/L)</td>
</tr>
<tr>
<td>≥ 3000 (&gt; 3.0 x 10⁹)</td>
<td>≥ 1500 (&gt; 1.5 x 10⁹)</td>
</tr>
<tr>
<td>Between 2500 and 3000 (2.5 x 10⁹-3.0 x 10⁹)</td>
<td>Between 1000 and 1500 (1.0 x 10⁹-1.5 x 10⁹)</td>
</tr>
<tr>
<td>&lt; 2500 (&lt; 2.5 x 10⁹)</td>
<td>&lt; 1000 (&lt; 1.0 x 10⁹)</td>
</tr>
</tbody>
</table>

### In the event of interruption of therapy for non-haematological reasons

Patients who have been on Clozaril for more than 18 weeks and have had their treatment interrupted for more than 3 days but less than 4 weeks should have their WBC count and ANC monitored weekly for an additional 6 weeks. If no haematological abnormality occurs, monitoring at intervals not exceeding 4 weeks may be resumed. If Clozaril treatment has been interrupted for 4 weeks or longer, weekly monitoring is required for the next 18 weeks of treatment.

### Other precautions

#### Eosinophilia

In the event of eosinophilia, discontinuation of Clozaril is recommended if the eosinophil count rises above 3000/mm³ (3.0 x 10⁹/L). Therapy should be re-started only after the eosinophil count has fallen below 1000/mm³ (1.0 x 10⁹/L).

#### Thrombocytopenia

In the event of thrombocytopenia, discontinuation of Clozaril is recommended if the platelet count falls below 50 000/mm³ (50.0 x 10⁹/L).
**Cardiovascular disorders**

In patients suffering from cardiovascular disorders (note: severe cardiovascular disorders are contraindications) the initial dose should be 12.5 mg given once on the first day, and dosage increase should be slow and in small increments (see section 4.2).

**Hypotension**

Orthostatic hypotension, with or without syncope, can occur during Clozaril treatment. Rarely (about one case per 3,000 Clozaril-treated patients), collapse can be profound and may be accompanied by cardiac and/or respiratory arrest. Such events are more likely to occur during initial titration in association with rapid dose escalation; on very rare occasions they occurred even after the first dose. Therefore, patients commencing Clozaril treatment require close medical supervision.

**Myocarditis/cardiomyopathy**

Tachycardia that persists at rest, accompanied by arrhythmias, shortness of breath or signs and symptoms of heart failure, may rarely occur during the first month of treatment and very rarely thereafter. The occurrence of these signs and symptoms necessitates an urgent diagnostic evaluation for myocarditis, especially during the titration period. Therefore, the possibility of myocarditis should be considered in patients receiving Clozaril who present with unexplained fatigue, dyspnoea, tachypnoea, fever, chest pain, tachycardia, palpitations, other signs and symptoms of heart failure, ECG changes (such as ST-T wave abnormalities) or arrhythmias. It is not known whether eosinophilia is a reliable predictor of myocarditis. The incidence of myocarditis, reported globally is rare (<0.1%) during the first month of therapy and very rare (<0.01%) thereafter. Some cases of myocarditis have been reported to be fatal (incidence approximately 0.2 cases/100,000 patient years). Most reported cases of myocarditis have occurred in the first month of therapy, therefore there should be a high index of suspicion in the first 6-8 weeks of therapy.

If the diagnosis of myocarditis is confirmed, Clozaril should be discontinued. There have been post-marketing reports of myocarditis including fatal cases. Later in treatment, the same signs and symptoms may very rarely occur and may be linked to cardiomyopathy. Further investigation should be performed and if the diagnosis is confirmed, the treatment should be stopped unless the benefit clearly outweighs the risk to the patient. If patients are diagnosed with cardiomyopathy while on Clozaril treatment, there is potential to develop mitral valve incompetence. Mitral valve incompetence has been reported in cases of cardiomyopathy related to Clozaril treatment. These cases of mitral valve incompetence reported either mild or moderate mitral regurgitation on two-dimensional echocardiography (2DEcho) (see section 4.8).

Monitoring of standing and supine blood pressure is necessary during the first weeks of treatment in patients with Parkinson’s disease.

Patients with clozapine-induced myocarditis or cardiomyopathy should not be re-exposed to Clozaril.

**Myocardial infarction**

In addition, there have been post-marketing reports of myocardial infarction including fatal cases. Causality assessment was difficult in the majority of these cases because of serious pre-existing cardiac disease and plausible alternative causes.

**Seizures**

Clozaril may lower seizure threshold. In patients with a history of seizures, or suffering from renal or cardiovascular disorders (note: severe renal or cardiovascular disorders are contraindications) the initial dose should be 12.5 mg given once on the first day, and dosage increase should be slow and in small increments (see section 4.2).

**Anticholinergic effects**

Clozapine exerts anticholinergic activity, which may produce adverse effects throughout the body. Careful supervision is indicated in the presence of prostatic enlargement and narrow-angle glaucoma. Probably on account of its anticholinergic properties, Clozaril has been associated with...
varying degrees of impairment of intestinal peristalsis, ranging from constipation to intestinal obstruction, faecal impaction, paralytic ileus, megacolon and intestinal infarction/ischaemia (see section 4.8). On rare occasions these cases have proved fatal. Since complications have been associated with delayed diagnosis, patients should be questioned about their bowel habits.

**Fever**

During Clozaril therapy, patients may experience transient temperature elevations above 38°C, with the peak incidence within the first 3 weeks of treatment. This fever is generally benign. Occasionally, it may be associated with an increase or decrease in the WBC count. Patients with fever should be carefully evaluated to rule out the possibility of an underlying infection or the development of agranulocytosis. In the presence of high fever, the possibility of neuroleptic malignant syndrome (NMS) must be considered.

**Falls**

Clozaril may cause seizures, somnolence, postural hypotension, motor and sensory instability, which may lead to falls and, consequently, fractures or other injuries. For patients with diseases, conditions, or medications that could exacerbate these effects, complete fall risk assessments when initiating antipsychotic treatment and recurrently for patients on long-term antipsychotic therapy.

**Neuroleptic Malignant Syndrome (NMS)**

If the diagnosis of NMS is confirmed, Clozaril should be discontinued immediately and appropriate medical measures should be administered.

**Metabolic changes**

Atypical antipsychotic drugs, including Clozaril, have been associated with metabolic changes that may increase cardiovascular/cerebrovascular risk. These metabolic changes may include hyperglycaemia, dyslipidemia, and body weight gain. While atypical antipsychotic drugs may produce some metabolic changes, each drug in the class has its own specific risk profile.

**Hyperglycaemia and Diabetes mellitus**

Hyperglycaemia, in some cases extreme and associated with ketoacidosis or hyperosmolar coma or death, has been reported in patients with atypical antipsychotics including Clozaril. Assessment of the relationship between atypical antipsychotic use and glucose abnormalities is complicated by the possibility of an increase background risk of diabetes mellitus in patients with schizophrenia and the increasing incidence of diabetes mellitus in the general population. Given these confounders, the relationship between atypical antipsychotic use and hyperglycaemia-related adverse events is not completely understood. However, epidemiological studies suggest an increased risk of treatment-emergent hyperglycaemia-related adverse events in patients treated with the atypical antipsychotics studied. Precise risk estimates for hyperglycaemia-related adverse events in patients treated with atypical antipsychotics are not available. The available data are insufficient to provide reliable estimates of differences in hyperglycaemia related adverse event risk among the marketed atypical antipsychotics.

Patients with an established diagnosis of diabetes mellitus who are started on atypical antipsychotics should be monitored regularly for worsening of glucose control. Patients with risk factors for diabetes mellitus (e.g. obesity, family history of diabetes) who are starting treatment with atypical antipsychotics should undergo fasting blood glucose testing at the baseline and periodically during treatment. Any patient treated with atypical antipsychotics should be monitored for symptoms of hyperglycaemia including polydipsia, polyuria, polyphagia, and weakness. Patients who develop symptoms of hyperglycaemia during treatment with atypical antipsychotics should undergo fasting blood glucose testing. In some cases, hyperglycaemia has resolved when the atypical antipsychotic was discontinued; however, some patients required continuation of anti-diabetic treatment despite discontinuation of the suspect drug. In patients with significant treatment-emergent hyperglycaemia, discontinuation of Clozaril should be considered.
There is a risk of altering the metabolic balance resulting in slight impairment of glucose homeostasis and a possibility of unmasking a pre-diabetic condition or aggravating pre-existing diabetes.

**Dyslipidemia**
Undesirable alterations in lipids have been observed in patients treated with atypical antipsychotics, including Clozaril. Clinical monitoring, including baseline and periodic follow-up lipid evaluations in patients using clozapine, is recommended.

**Weight gain**
Weight gain has been observed with atypical antipsychotic use, including Clozaril. Clinical monitoring of weight is recommended.

**Risk of thromboembolism**
Since Clozaril may cause sedation and weight gain, thereby increasing the risk of thromboembolism, immobilisation of patients should be avoided.

**Cerebrovascular adverse events**
An increased risk of cerebrovascular adverse events has been seen in the dementia population with some atypical antipsychotics. The mechanism for this increased risk is not known. An increased risk cannot be excluded for other antipsychotics or other patient populations. Clozaril should be used with caution in patients with risk factors for stroke.

**Prolongation of QT interval**
As with other antipsychotics, caution is advised in patients with known cardiovascular disease or family history of QT prolongation.

As with other antipsychotics, caution should be exercised when Clozaril is prescribed with medicines known to increase the QTc interval.

**Parkinson’s disease**
Physicians should weigh the risks versus the benefits when prescribing clozapine to patients with Parkinson’s Disease or dementia with Lewy Bodies (DLB) since both groups may be at increased risk of Neuroleptic Malignant Syndrome as well as having an increased sensitivity to antipsychotics. Manifestation of this increased sensitivity can include confusion, obtundation, postural instability with frequent falls, in addition to extrapyramidal symptoms.

**Suicide**
The possibility of a suicide attempt is inherent in schizophrenia and close supervision of high-risk patients should accompany therapy.

**Special populations**

**Liver disease**
Patients with stable pre-existing liver disorders may receive Clozaril, but must undergo regular liver function tests. Such tests should be performed immediately in patients who develop symptoms of possible liver dysfunction such as nausea, vomiting and/or anorexia during Clozaril treatment. If the elevation of the values is clinically relevant or if symptoms of jaundice occur, treatment with Clozaril must be discontinued. It may be resumed (see section 4.2) only when the results of liver function tests are normal. In such cases, liver function should be closely monitored after re-introduction of Clozaril.

**Renal impairment**
In patients suffering from mild to moderate renal impairment, an initial dose of 12.5 mg/day (half a 25 mg tablet) is recommended (see section 4.2).
Patients aged 60 years and older

It is recommended that treatment be initiated at a particularly low dose (12.5 mg given once on the first day) and subsequent dose increments be restricted to 25 mg/day.

Clinical studies with Clozaril did not include sufficient numbers of subjects aged 60 years and over to determine whether or not they respond differently from younger subjects.

Orthostatic hypotension can occur with Clozaril treatment and there have been rare reports of tachycardia, which may be sustained, in patients taking Clozaril. Patients aged 60 years and over, particularly those with compromised cardiovascular function, may be more susceptible to these effects.

Patients aged 60 years and over may also be particularly susceptible to the anticholinergic effects of clozapine, such as urinary retention and constipation.

Patients aged 60 years and older with dementia-related psychosis

In patients aged 60 years and over with dementia-related psychosis, the efficacy and safety of clozapine has not been studied. Observational studies suggest that patients aged 60 years and over with dementia-related psychosis treated with antipsychotic drugs are at an increased risk of death. In the published literature, risk factors that may predispose this patient population to increased risk of death when treated with antipsychotics include sedation, the presence of cardiac conditions (e.g. cardiac arrhythmias) or pulmonary conditions (e.g. pneumonia, with or without aspiration). Clozaril is not approved for the treatment of dementia-related behavioural disturbances.

Rebound, withdrawal effects

If abrupt discontinuation of Clozaril is necessary (e.g. because of leucopenia), the patient should be carefully observed for the recurrence of psychotic symptoms and symptoms related to cholinergic rebound such as profuse sweating, headache, nausea, vomiting and diarrhoea.

4.5 Interaction with other medicines and other forms of interaction

Pharmacodynamic-related interactions

Anticipated pharmacodynamic interactions resulting in concomitant use not being recommended

Medicinal products known to have a substantial potential to depress bone marrow function should not be used concurrently with Clozaril (see section 4.4).

As with other antipsychotics, caution should be exercised when Clozaril is prescribed with medicines known to increase the QTc interval, or cause electrolyte imbalance.

Observed pharmacodynamic interactions to be considered

Particular caution is recommended when Clozaril therapy is initiated in patients who are receiving (or have recently received) a benzodiazepine or any other psychotropic agent, as these patients may have an increased risk of circulatory collapse, which, on rare occasions, can be profound and may lead to cardiac and/or respiratory arrest.

Concomitant use of lithium or other CNS-active agents may increase the risk of development of neuroleptic malignant syndrome (NMS).

Rare but serious reports of seizures, including onset of seizures in non-epileptic patients, and isolated cases of delirium where Clozaril was co-administered with valproic acid have been reported. These effects are possibly due to a pharmacodynamic interaction, the mechanism of which has not been determined.
Anticipated pharmacodynamic interactions to be considered

Clozapine may enhance the central effects of alcohol, MAO inhibitors and CNS depressants such as narcotics, antihistamines, and benzodiazepines.

Because of the possibility of additive effects, caution is essential when substances possessing anticholinergic, hypotensive, or respiratory depressant effects are given concomitantly.

Owing to its anti-alpha-adrenergic properties, clozapine may reduce the blood pressure-increasing effect of noradrenaline or other predominantly alpha-adrenergic agents and reverse the pressor effect of adrenaline.

Pharmacokinetic-related interactions

Clozapine is a substrate for many CYP 450 isoenzymes, in particular 1A2 and 3A4. The risk of metabolic interactions caused by an effect on an individual isoform is therefore minimised. Nevertheless, caution is called for in patients receiving concomitant treatment with other substances that are either inhibitors or inducers of these enzymes.

No clinically relevant interactions have been observed thus far with tricyclic antidepressants, phenothiazines or type 1c anti-arrhythmics, which are known to bind to cytochrome P450 2D6.

Observed pharmacokinetic interactions to be considered

Concomitant administration of substances known to induce cytochrome P450 enzymes may decrease the plasma levels of clozapine.

- Substances known to induce the activity of 3A4 and with reported interactions with clozapine include, for instance, carbamazepine, phenytoin and rifampicin.

Concomitant administration of substances known to inhibit the activity of cytochrome P450 isozymes may increase the plasma levels of clozapine.

- Substances known to inhibit the activity of the major isozymes involved in the metabolism of clozapine and with reported interactions include, for instance, cimetidine, erythromycin (3A4), fluvoxamine (1A2), perazine (1A2), ciprofloxacin (1A2) and oral contraceptives (1A2, 3A4, 2C19).
- The plasma concentration of clozapine is increased by caffeine (1A2) intake and decreased by nearly 50% following a 5-day caffeine-free period.
- Elevated clozapine plasma concentrations also have been reported in patients receiving the substances in combination with selective serotonin re-uptake inhibitors (SSRIs) such as paroxetine (1A2), sertraline, fluoxetine or citalopram.

Anticipated pharmacokinetic interactions to be considered

Concomitant administration of substances known to induce cytochrome P450 enzymes may decrease the plasma levels of clozapine.

- Known inducers of 1A2 include, for instance, omeprazole and tobacco smoke. In cases of sudden cessation of tobacco smoking, the plasma clozapine concentration may be increased, thus leading to an increase in adverse effects.

Concomitant administration of substances known to inhibit the activity of cytochrome P450 isozymes may increase the plasma levels of clozapine.

- Potent inhibitors of CYP3A, such as azole antimycotics and protease inhibitors, could potentially also increase clozapine plasma concentrations; no interactions have been reported to date, however.
4.6 Fertility, pregnancy and lactation

Pregnancy

Reproduction studies in animals have revealed no evidence of impaired fertility or harm to the foetus due to clozapine. However, the safe use of Clozaril in pregnant women has not been established. Therefore, Clozaril should be used in pregnancy only if the expected benefit clearly outweighs any potential risk.

Non-teratogenic effects

Neonates exposed to antipsychotic drugs, during the third trimester of pregnancy are at risk for extrapyramidal and/or withdrawal symptoms following delivery. There have been reports of agitation, hypertonia, hypotonia, tremor, somnolence, respiratory distress and feeding disorder in these neonates. These complications have varied in severity; while in some cases symptoms have been self-limited, in other cases neonates have required intensive care unit support and prolonged hospitalization.

Antipsychotic drugs, including Clozaril, should be used during pregnancy only if the potential benefit justifies the potential risk to the foetus.

Breast-feeding

Animal studies suggest that clozapine is excreted in breast milk and has an effect in the suckling offspring; therefore, mothers receiving Clozaril should not breast-feed.

Women of childbearing potential and contraceptive measures

Some female patients treated with antipsychotics other than Clozaril may become amenorrheic. A return to normal menstruation may occur as a result of switching from other antipsychotics to Clozaril. Adequate contraceptive measures must therefore be ensured in women of childbearing potential.

Fertility

No data available. For pre-clinical fertility data refer to section 5.3.

4.7 Effects on ability to drive and use machines

Owing to the ability of Clozaril to cause sedation and lower the seizure threshold, activities such as driving or operating machinery should be avoided, especially during the initial weeks of treatment.

4.8 Undesirable effects

The adverse effects of clozapine are most often predictable based on its pharmacological properties with the exception of agranulocytosis (see section 4.4).

The most serious adverse reactions experienced with clozapine are agranulocytosis, seizure, cardiovascular effects and fever (see section 4.4). The most common side effects are drowsiness/sedation, dizziness, tachycardia, constipation, and hypersalivation.

Data from the clinical trials experience showed that a varying proportion of clozapine-treated patients (from 7.1 to 15.6%) were discontinued due to an adverse event, including only those that could be reasonably attributed to clozapine. The more common events considered to be causes of discontinuation were leukopenia; somnolence; dizziness (excluding vertigo); and psychotic disorder.

Table 3 Treatment-emergent adverse experience frequency estimate from spontaneous and clinical trial reports

| Adverse reactions are ranked by MedDRA system organ class under headings of frequency, using the following convention: Very common (≥1/10), common (≥1/100, <1/10), uncommon (≥1/1,000, <1/100), rare (≥1/10,000, <1/1,000), very rare (<1/10,000), including isolated reports. |
### Blood and lymphatic system disorders

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common</td>
<td>Leukopenia/decreased WBC/neutropenia, eosinophilia, leukocytosis</td>
</tr>
<tr>
<td>Uncommon</td>
<td>Agranulocytosis</td>
</tr>
<tr>
<td>Rare</td>
<td>Anaemia</td>
</tr>
<tr>
<td>Very rare</td>
<td>Thrombocytopenia, thrombocythaemia</td>
</tr>
</tbody>
</table>

### Metabolism and nutrition disorders

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common</td>
<td>Weight gain</td>
</tr>
<tr>
<td>Rare</td>
<td>Impaired glucose tolerance, new onset diabetes, diabetes aggravated</td>
</tr>
<tr>
<td>Very rare</td>
<td>Ketoacidosis, hyperosmolar coma, severe hyperglycaemia, hypercholesterolaemia, hypertriglyceridaemia</td>
</tr>
</tbody>
</table>

### Psychiatric disorders

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common</td>
<td>Dysarthria</td>
</tr>
<tr>
<td>Uncommon</td>
<td>Dysphemia</td>
</tr>
<tr>
<td>Rare</td>
<td>Restlessness, agitation</td>
</tr>
</tbody>
</table>

### Nervous system disorders

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very common</td>
<td>Drowsiness/sedation, dizziness</td>
</tr>
<tr>
<td>Common</td>
<td>Blurred vision, headache, tremor, rigidity, akathisia, extrapyramidal symptoms, seizures/convulsions/myoclonic jerks</td>
</tr>
<tr>
<td>Uncommon</td>
<td>Neuroleptic malignant syndrome</td>
</tr>
<tr>
<td>Rare</td>
<td>Confusion, delirium</td>
</tr>
<tr>
<td>Very rare</td>
<td>Tardive dyskinesia, obsessive compulsive symptoms</td>
</tr>
</tbody>
</table>

### Eye disorders

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common</td>
<td>Blurred vision</td>
</tr>
</tbody>
</table>

### Cardiac disorders

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very common</td>
<td>Tachycardia</td>
</tr>
<tr>
<td>Common</td>
<td>ECG changes</td>
</tr>
<tr>
<td>Rare</td>
<td>Circulatory collapse, arrhythmias, myocarditis, pericarditis</td>
</tr>
<tr>
<td>Very rare</td>
<td>Cardiomyopathy</td>
</tr>
</tbody>
</table>

### Vascular system disorders

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common</td>
<td>Hypertension, postural hypotension, syncope</td>
</tr>
<tr>
<td>Rare</td>
<td>Thromboembolism</td>
</tr>
</tbody>
</table>

### Respiratory disorders

<table>
<thead>
<tr>
<th>Frequency</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rare</td>
<td>Aspiration of ingested food, pneumonia and lower respiratory tract infection which may be fatal</td>
</tr>
<tr>
<td>Frequency</td>
<td>Adverse Effect</td>
</tr>
<tr>
<td>------------</td>
<td>------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Very rare</td>
<td>Respiratory depression/arrest</td>
</tr>
<tr>
<td><strong>Gastrointestinal disorders</strong></td>
<td></td>
</tr>
<tr>
<td>Very common</td>
<td>Constipation, hypersalivation</td>
</tr>
<tr>
<td>Common</td>
<td>Nausea, vomiting, dry mouth</td>
</tr>
<tr>
<td>Rare</td>
<td>Dysphagia</td>
</tr>
<tr>
<td>Very rare</td>
<td>Parotid gland enlargement, intestinal obstruction/ileus/faecal impaction, abdominal discomfort, heartburn</td>
</tr>
<tr>
<td><strong>Hepatobiliary disorders</strong></td>
<td></td>
</tr>
<tr>
<td>Common</td>
<td>Elevated liver enzymes</td>
</tr>
<tr>
<td>Rare</td>
<td>Hepatitis, cholestatic jaundice, pancreatitis</td>
</tr>
<tr>
<td>Very rare</td>
<td>Fulminant hepatic necrosis</td>
</tr>
<tr>
<td><strong>Skin and subcutaneous tissue disorders</strong></td>
<td></td>
</tr>
<tr>
<td>Very rare</td>
<td>Skin reactions</td>
</tr>
<tr>
<td><strong>Renal and urinary disorders</strong></td>
<td></td>
</tr>
<tr>
<td>Common</td>
<td>Urinary incontinence, urinary retention</td>
</tr>
<tr>
<td>Very rare</td>
<td>Interstitial nephritis, nocturnal enuresis</td>
</tr>
<tr>
<td><strong>Reproductive system disorders</strong></td>
<td></td>
</tr>
<tr>
<td>Very rare</td>
<td>Priapism</td>
</tr>
<tr>
<td><strong>General disorders</strong></td>
<td></td>
</tr>
<tr>
<td>Common</td>
<td>Fatigue, benign hyperthermia, disturbances in sweating/temperature regulation</td>
</tr>
<tr>
<td>Uncommon</td>
<td>Neuroleptic malignant syndrome</td>
</tr>
<tr>
<td>Very rare</td>
<td>Sudden unexplained death</td>
</tr>
<tr>
<td><strong>Investigations</strong></td>
<td></td>
</tr>
<tr>
<td>Rare</td>
<td>Increased CPK</td>
</tr>
</tbody>
</table>

* Occasionally patients with pre-existing hyperglycaemia have had an exacerbation

** The prompt discontinuation of Clozaril therapy is warranted upon suspicion of myocarditis (see section 4.4).

Very rare events of ventricular tachycardia, cardiac arrest and QT prolongation which may be associated with Torsades De Pointes have been observed although there is no conclusive causal relationship to the use of this medicine.

**AEs from spontaneous reports and literature (frequency unknown)**

The following post-marketing adverse effects were derived from experience with Clozaril via spontaneous case reports and literature cases and have been categorized according to MedDRA system organ class (Table 4). Because these have been reported voluntarily from a population of uncertain size and are subject to confounding factors, these post-marketing AEs have been categorized with a frequency of “unknown” since it is not possible to reliably estimate their frequency. Adverse effects are listed according to system organ classes (SOC) in MedDRA. Within each system organ class, AEs are presented in order of decreasing seriousness.
Table 4: Adverse drug reactions from spontaneous reports and literature (frequency not known)

<table>
<thead>
<tr>
<th>SOC</th>
<th>Adverse effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Infections and infestations</td>
<td>Sepsis</td>
</tr>
<tr>
<td>Immune system disorders</td>
<td>Angioedema, leukocytoclastic vasculitis</td>
</tr>
<tr>
<td>Endocrine disorders</td>
<td>Pseudophaeochromocytoma</td>
</tr>
<tr>
<td>Nervous system disorders and nutrition</td>
<td>Cholinergic syndrome, EEG changes, pleurothotonus, restless legs syndrome</td>
</tr>
<tr>
<td>disorders</td>
<td>Obesity</td>
</tr>
<tr>
<td>Cardiac disorders</td>
<td>Myocardial infarction sometimes fatal, myocarditis sometimes fatal, chest pain/angina pectoris, palpitations, atrial fibrillation, mitral valve incompetence associated with clozapine related cardiomyopathy</td>
</tr>
<tr>
<td>Vascular disorders</td>
<td>Hypotension</td>
</tr>
<tr>
<td>Respiratory, thoracic and mediastinal</td>
<td>Pleural effusion, sleep apnoea syndrome, nasal congestion</td>
</tr>
<tr>
<td>disorders</td>
<td>Megacolon sometimes fatal, intestinal infarction/ischaemia sometimes fatal, diarrhoea, abdominal discomfort/heartburn/dyspepsia, colitis</td>
</tr>
<tr>
<td>Gastrointestinal disorders</td>
<td>Hepatic steatosis, hepatic necrosis, hepatotoxicity,</td>
</tr>
<tr>
<td></td>
<td>hepatic fibrosis, hepatic cirrhosis, liver disorders including those hepatic events leading to life-threatening consequences such as liver injury (hepatic, cholestatic and mixed), liver failure which may be fatal and liver transplant</td>
</tr>
<tr>
<td>Hepatobiliary disorders</td>
<td>Pigmentation disorder</td>
</tr>
<tr>
<td>Skin and subcutaneous tissue disorders</td>
<td>Rhabdomyolysis, muscle weakness, muscle spasms, muscle pain, systemic lupus erythematosus</td>
</tr>
<tr>
<td>Musculoskeletal &amp; connective tissue</td>
<td>Renal failure, nocturnal enuresis</td>
</tr>
<tr>
<td>disorders</td>
<td>Retrograde ejaculation</td>
</tr>
<tr>
<td>Renal and urinary disorders</td>
<td>Polyserositis</td>
</tr>
<tr>
<td>Reproductive system and breast disorders</td>
<td>Falls (associated with clozapine-induced seizures, somnolence, postural hypotension, motor and sensory instability)</td>
</tr>
<tr>
<td>General disorders and administration site</td>
<td></td>
</tr>
<tr>
<td>conditions</td>
<td></td>
</tr>
<tr>
<td>Injury, poisoning and procedural</td>
<td></td>
</tr>
<tr>
<td>complications</td>
<td></td>
</tr>
</tbody>
</table>

Reporting of suspected adverse reactions

Reporting suspected adverse reactions after authorisation 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/](https://nzphvc.otago.ac.nz/reporting/)

4.9 Overdose

In cases of acute intentional or accidental Clozaril overdosage, for which information on the outcome is available, to date the mortality is about 12%. Most of the fatalities were associated with cardiac failure or pneumonia caused by aspiration and occurred at doses above 2000 mg. There have been reports of patients recovering from an overdose in excess of 10 000 mg. However, in a few adult individuals, primarily those not previously exposed to Clozaril, the ingestion of doses as low as 400 mg led to life-threatening comatose conditions and, in one case, to death. In young children, the intake of 50 mg to 200 mg resulted in strong sedation or coma without being lethal.
Signs and symptoms
Drowsiness, lethargy, areflexia, coma, confusion, hallucinations, agitation, delirium, extrapyramidal symptoms, hyper-reflexia, convulsions; hypersalivation, mydriasis, blurred vision, thermolability; hypotension, collapse, tachycardia, cardiac arrhythmias; aspiration pneumonia, dyspnoea, respiratory depression or failure.

Treatment
There are no specific antidotes for Clozaril.

Gastric lavage and/or the administration of activated charcoal within the first 6 hours after Clozaril ingestion. (Peritoneal dialysis and haemodialysis are unlikely to be effective.) Symptomatic treatment under continuous cardiac monitoring, surveillance of respiration, monitoring of electrolytes and acid-base balance. The use of adrenaline should be avoided in the treatment of hypotension because of the possibility of a reverse adrenaline effect.

Close medical supervision is necessary for at least 5 days because of the possibility of delayed reactions.

For further advice on management of overdose please contact the National Poisons Information Centre (0800 POISON or 0800 764 766).

5. Pharmacological Properties

5.1 Pharmacodynamic properties
Pharmacotherapeutic group: Antipsychotic, ATC code: N05AH02

Mechanism of action
Clozaril has been shown to be an antipsychotic agent that is different from classic antipsychotics.

In pharmacological experiments, the compound does not induce catalepsy or inhibit apomorphine- or amphetamine-induced stereotyped behaviour. It has only weak dopamine receptor-blocking activity at D₁, D₂, D₃ and D₅ receptors, but shows high potency for the D₄ receptor, in addition to potent anti-alpha-adrenergic, anticholinergic, antihistaminic, and arousal reaction-inhibiting effects. It has also been shown to possess antiserotonergic properties.

Pharmacodynamic effects
Clinically Clozaril produces rapid and marked sedation, and exerts antipsychotic effects in patients with schizophrenia resistant to other antipsychotic agents. In such cases, Clozaril has proven effective in relieving both positive and negative schizophrenic symptoms in short- and long-term trials.

Clozaril is unique in that it produces virtually no major extrapyramidal reactions such as acute dystonia and tardive dyskinesia. Furthermore, parkinsonian-like side effects and akathisia are rare. In contrast to classical antipsychotics, clozapine produces little or no prolactin elevation, thus avoiding adverse effects such as gynaecomastia, amenorrhoea, galactorrhoea, and impotence.

Potentially serious adverse reactions caused by Clozaril therapy are granulocytopenia and agranulocytosis occurring at an estimated incidence of 3% and 0.7% respectively (see section 4.4).

Clinical efficacy and safety
Clozapine study 30
In a double-blind clinical trial performed in 319 treatment-resistant patients, clinically relevant improvement was observed within 6 weeks in about 30% of the Clozaril-treated patients. Two open-
label trials in which patients were treated for 12 months, showed clinically relevant improvement in 37% of patients within the first 6 weeks of treatment and in an additional 39%-44% of patients by the end of 12 months. The improvement was defined as a reduction of more than 20% from baseline in Brief Psychiatric Rating Scale Score. In addition, improvement in some aspects of cognitive dysfunction has been described.

5.2 Pharmacokinetic properties

Absorption
The absorption of orally administered clozapine is 90% to 95%; neither the rate nor the extent of absorption is influenced by food.

Clozapine is subject to moderate first-pass metabolism, resulting in an absolute bioavailability of 50% to 60%.

Distribution
In steady-state conditions, when given twice daily, peak blood levels occur on an average at 2.1 hours (range: 0.4 to 4.2 hours), and the volume of distribution is 1.6 L/kg. Clozapine is approximately 95% bound to plasma proteins.

Biotransformation
Clozapine is almost completely metabolised before excretion by CYP1A2 and 3A4, and to some extent by CYP2C19 and 2D6. Of the main metabolites only the desmethyl metabolite was found to be active. Its pharmacological actions resemble those of clozapine, but are considerably weaker and of short duration.

Elimination
Its elimination is biphasic, with a mean terminal half-life of 12 hours (range: 6 to 26 hours). After single doses of 75 mg the mean terminal half-life was 7.9 hours; it increased to 14.2 hours when steady-state conditions were reached by administering daily doses of 75 mg for at least 7 days.

Only trace amounts of unchanged drug are detected in the urine and faeces, approximately 50% of the administered dose being excreted as metabolites in the urine and 30% in the faeces.

Linearity/non-linearity
Dosage increases from 37.5 mg to 75 mg and 150 mg given twice daily were found to result during steady state in linearly dose-proportional increases in the area under the plasma concentration/time curve (AUC), and in the peak and minimum plasma concentrations.

5.3 Preclinical safety data

Preclinical data reveal no special hazard for humans based on conventional studies of safety pharmacology, repeated dose toxicity, genotoxicity and carcinogenic potential.

Mutagenicity
Clozapine and/or its metabolites were devoid of genotoxic potential when investigated for induction of gene mutations, chromosome aberrations and primary DNA-damage in a spectrum of in vitro mutagenicity tests. No clastogenic activity was observed in vivo (bone marrow micronucleus test in mice).

Carcinogenicity
In Sprague-Dawley (CD) rats treated in the diet for 24 months, maximum tolerated doses of 35 mg/kg per day revealed no carcinogenic potential of clozapine. Likewise, no evidence of tumorigenic effects was obtained in two 78-week feeding studies in Charles River (CD) mice. In the first study, oral dose
levels of up to 64 mg/kg were administered to males, and of up to 75 mg/kg to females respectively. In the second study, the drug intake achieved for both sexes was 61 mg/kg per day.

Reproductive toxicity
No embryotoxic or teratogenic potential of clozapine was observed in rats or rabbits. In male rats treated for 70 days prior to mating, fertility was unaffected.

In female rats, fertility as well as pre- and postnatal development of the offspring was not adversely affected by oral clozapine treatment prior to mating. When rats were treated during the later part of pregnancy and during lactation, survival rates of the youngs from lactating dams, treated at dose levels up to 40 mg/kg body weight, were lowered and the youngs were hyperactive. However, there was no lasting effect on pup development after weaning.

6. Pharmaceutical Particulars

6.1 List of excipients
Magnesium stearate, silica, colloidal anhydrous, povidone, talc, maize starch, lactose monohydrate.

Clozaril tablets are gluten free.

6.2 Incompatibilities
Not applicable.

6.3 Shelf life
PVC/PE/PVdC/Aluminium blisters: 3 years.

PVC/PVdC/Aluminium blisters: 4 years.

Bottles: 5 years.

6.4 Special precautions for storage
Blisters: store below 30°C.

Bottles: store below 25°C.

Clozaril must be kept out of the reach and sight of children.

6.5 Nature and contents of container
Type III brown glass with a closure consisting of a stopper made of colourless low-density polyethylene containing 100 tablets.

PVC/PE/PVdC/Aluminium or PVC/PVDC/Aluminium blister packs containing 50 tablets.

Not all pack types and sizes may be marketed.

6.6 Special precautions for disposal
Any unused medicine or waste material should be disposed of in accordance with local requirements.

7. Medicines Schedule
Prescription Medicine
8. Sponsor Details
Mylan New Zealand Ltd
PO Box 11183
Ellerslie
AUCKLAND
Telephone 09-579-2792

9. Date of First Approval
Provisional consent for distribution of Clozaril under Section 23 of the Medicines Action has been granted. This consent is valid for 2 years from 10 July 2016. The consent is given subject to the conditions detailed at the beginning of the data sheet.

10. Date of Revision of the Text
17 January 2018  Change in sponsor from Novartis New Zealand Limited to Mylan New Zealand Limited. Data sheet reformatted to the Mylan NZ style SmPC format.