Summary of Product Characteristics for Pharmaceutical Products

1. Name of the medicinal product:
MICROMOL IV 1% w/v solution for infusion

2. Qualitative and quantitative composition
Each 100 ml vial contains 1 g paracetamol BP.

This product contains mannitol.

For the full list of excipients, see section 6.1.

3. Pharmaceutical form
Solution for infusion.

Clear, non-pyrogenic, and particle-free solution.

pH: 5.0 – 6.0

Osmolality: 285 - 320 mOsm/kg

4. Clinical particulars
4.1 Therapeutic indications
Paracetamol 10 mg/ml solution for infusion is indicated for the short-term treatment of moderate pain, especially following surgery, and the short-term treatment of fever, when administration by intravenous route is clinically justified by an urgent need to treat pain or hyperthermia and/or when other routes of administration are not possible.

4.2 Posology and method of administration
The 100 ml vial of Micromol IV is restricted to adults, adolescents, and children weighing over 33 kg.

The 50 ml vial is adapted to term newborn infants, infants, toddlers, and children weighing less than 33 kg.

Posology

Dosing based on patient weight - see the dosing table below.

Patient weight	**Dose/ administration**	**Volume/ administration**	**Maximum volume of paracetamol, solution for infusion (10mg/ml) per administration based on upper weight limits of the group (ml)****	**Maximum Daily Dose ***
≤10 kg *	7.5 mg/kg	0.75 ml/kg	7.5ml	30 mg/kg

> 10 kg to ≤33kg	15 mg/kg	1.5ml/kg	49.5ml	60mg/kg not exceeding 2g
> 33 kg to ≤50kg	15 mg/kg	1.5ml/kg	75 ml	60mg/kg not exceeding 3g
>50kg with Additional risk Factors for hepatotoxicity	1g	100ml	100ml	3g
> 50 kg and no additional risk Factors for hepatotoxicity	1 g	100ml	100ml	4g

*Pre-term newborn infants: No safety and efficacy data are available for pre-term newborn infants (see section 5.2).

** Patients weighing less will require smaller volumes.

*** Maximum daily dose: The maximum daily dose as presented in the table above is for patients who are not receiving other paracetamol-containing products and should be adjusted accordingly, taking such products into account.

The minimum interval between each administration must be at least 4 hours.

The minimum interval between each administration in patients with severe renal impairment must be at least 6 hours.

No more than 4 doses to be given in 24 hours**.**

Elderly

Dose adjustment is not required in elderly people (see section 5.2).

Severe renal insufficiency:

It is recommended, when giving paracetamol to patients with severe renal impairment (creatinine clearance ≤ 30 ml/min), to reduce the dose and increase the minimum interval between each administration to 6 hours (See section 5.2).

Adults with hepatocellular insufficiency, chronic alcoholism, chronic malnutrition (low reserves of hepatic glutathione), and dehydration:

The maximum daily dose must not exceed 3 g (see section 4.4).

Method of administration

The paracetamol solution is administered as a 15-minute intravenous infusion.

Patients weighing ≤ 10 kg:

- The glass vial/bag of paracetamol, solution for infusion, should not be hung as an infusion due to the small volume of the medicinal product to be administered in this population
- The volume to be administered should be withdrawn from the vial/bag and diluted in a 0.9% sodium chloride solution or 5% glucose solution up to one-tenth (one volume paracetamol, solution for infusion, into nine volumes diluent) and administered over 15 minutes. Use the diluted solution within the hour following its preparation (infusion time included). See also section 6.6.
- A 5- or 10-ml syringe should be used to measure the dose as appropriate for the weight of the child and the desired volume. However, this should never exceed 7.5 mL per dose
- The user should be referred to the product information for dosing guidelines.
- For instructions on dilution of the medicinal product before administration, see section 6.6.
- For single use only. Any unused solution should be discarded.
- Before administration, the product should be visually inspected for any particulate matter and discoloration.

Text for the 50ml and 100ml vials:

To remove the solution, use a 0.8 mm needle (21-gauge needle) and vertically perforate the stopper at the spot specifically indicated.

As for all solutions for infusion presented in glass vials, it should be remembered that close monitoring is needed, notably at the end of the infusion, regardless of the administration route. This monitoring at the end of the infusion applies particularly for central route infusions, to avoid air embolism

50ml vial only

Paracetamol can be diluted in a 0.9% sodium chloride solution or 5% glucose solution (one volume into nine volumes of diluent). In this case, use the diluted solution within the hour following its preparation (infusion time included).

Take care when prescribing and administering Paracetamol 10 mg/ml solution for infusion to avoid dosing errors due to confusion between milligram (mg) and milliliter (ml), which could result in accidental overdose and death.

Take care to ensure the proper dose is communicated and dispensed.

When writing prescriptions, include both the total dose in mg and the total dose in volume.

Take care to ensure the dose is measured and administered accurately.

4.3 Contraindications

Hypersensitivity to paracetamol, propacetamol hydrochloride (prodrug of paracetamol), or to any of the excipients listed in section 6.1.

Cases of severe hepatocellular insufficiency.

4.4 Special warnings and precautions for use

Warning

RISK OF MEDICATION ERRORS

Take care to avoid dosing errors due to confusion between milligram (mg) and milliliter (ml), which could result in accidental overdose and death (see section 4.2).

Appropriate oral analgesia is recommended as soon as this route of administration can be used.

To avoid the risk of overdose, check that other medicines administered do not contain either paracetamol or propacetamol.

Doses higher than those recommended cause a risk of very severe liver damage. The symptoms and clinical signs of liver damage (including fulminant hepatitis, hepatic insufficiency, cholestatic hepatitis, cytolytic hepatitis) are generally observed after 2 days and normally reach their peak within 4 to 6 days. Treatment with an antidote should be administered as soon as possible.

Paracetamol can cause serious skin reactions. Patients should be informed about the early signs of serious skin reactions, and the use of the drug should be discontinued at the first appearance of skin rash or any other sign of hypersensitivity.

As for all solutions for infusion presented in glass vials, close monitoring is needed, notably at the end of the infusion.

Precautions for use

Paracetamol should be used with caution in cases of:

- hepatocellular insufficiency,
- severe renal insufficiency (creatinine clearance ≤ 30 mL/min),
- chronic alcoholism,
- chronic malnutrition (low reserves of hepatic glutathione),
- dehydration.
- patients suffering from a genetically caused G-6-PD deficiency (favism), the occurrence of a haemolytic anaemia is possible due to the reduced allocation of glutathione following the administration of paracetamol.

Caution is advised if paracetamol is administered concomitantly with flucloxacillin due to increased risk of high anion gap metabolic acidosis (HAGMA), particularly in patients with severe renal impairment, sepsis, malnutrition, and other sources of glutathione deficiency (e.g., chronic alcoholism), as well as those using maximum daily doses of paracetamol. Close monitoring, including measurement of urinary 5-oxoproline, is recommended.

Excipients

This medicine contains less than 1 mmol sodium (23 mg) per 50ml vial and 100ml vial, that is to say, essentially 'sodium-free'.

4.5 Interaction with other medicinal products and other forms of interaction

Probenecid causes an almost two-fold reduction in the clearance of paracetamol by inhibiting its conjugation with glucuronic acid. A reduction in the paracetamol dose should be considered if it is to be used concomitantly with probenecid.

Salicylamide may prolong the elimination half-life of paracetamol.

Caution should be paid to the concomitant intake of enzyme-inducing substances. These substances include, but are not limited to, barbiturates, isoniazid, carbamazepine, rifampicin, and ethanol.

Concomitant use of paracetamol (4,000 mg per day for at least 4 days) with oral anticoagulants may lead to slight variations in INR values. In this case, increased monitoring of INR values should be conducted during the period of concomitant use as well as for 1 week after paracetamol treatment has been discontinued.

Caution should be taken when paracetamol is used concomitantly with flucloxacillin as concurrent intake has been associated with high anion gap metabolic acidosis, especially in patients with high-risk factors.

4.6 Pregnancy and Lactation

Pregnancy:

Clinical experience of intravenous administration of paracetamol is limited. However, epidemiological data from the use of oral therapeutic doses of paracetamol indicate no undesirable effects on the pregnancy or on the health of the foetus / newborn infant.

If clinically needed, paracetamol can be used during pregnancy; however, it should be used at the lowest effective dose for the shortest possible time and at the lowest possible frequency.

Prospective data on pregnancies exposed to overdoses did not show an increase in malformation risk.

Reproductive studies with the intravenous form of paracetamol have not been performed in animals. However, studies with the oral route did not show any malformation or fetotoxic effects.

Nevertheless, paracetamol should only be used during pregnancy after a careful benefit-risk assessment. In this case, the recommended posology and duration must be strictly observed.

Lactation:

After oral administration, paracetamol is excreted into breast milk in small quantities. No undesirable effects on nursing infants have been reported. Consequently, Micromol IV 10 mg/ml solution for infusion may be used in breastfeeding women.

4.7 Effects on the ability to drive and use machines

Not relevant.

4.8 Undesirable effects

The frequency of adverse events listed below is defined using the following convention:

Common (≥1/100 to <1/10); Rare (≥ 1/10,000 to < 1/1,000); Very rare (< 1/10,000), Not known (cannot be estimated from the available data).

System Organ Class	Common	Rare	Very rare	Not known
Blood and lymphatic system disorders			Thrombocytopenia, Leucopenia, Neutropenia	

Immune system disorders			Hypersensitivity reaction (1) Anaphylactic shock (1)	
Metabolism and nutrition disorders			High anion gap metabolic acidosis (HAGMA) (4)	
Cardiac disorders				Tachycardia (2)
Vascular disorders		Hypotension		Flushing (2)
Hepatobiliary disorders		Increased levels of hepatic transaminases		
Skin and subcutaneous tissue disorders			Rash (1), Urticaria (1), Serious skin reactions (3)	Pruritus (2), Erythema (2)
General disorders and administration site conditions	Administration site reaction (pain and burning sensation)	Malaise		

(1) Very rare cases of hypersensitivity reactions ranging from simple skin rash or urticaria to anaphylactic shock have been reported and require discontinuation of treatment.

(2) Isolated cases

(3) Very rare cases of serious skin reactions have been reported and required discontinuation of treatment.

(4) Post-marketing experience when paracetamol is used concomitantly with flucloxacillin; generally, in the presence of risk factors (see section 4.4).

Cases of erythema, flushing, pruritus, and tachycardia have been reported

Frequent adverse reactions at the injection site have been reported during clinical trials (pain and burning sensation).

Reporting of suspected adverse reactions

Reporting suspected adverse reactions after authorization of the medicinal product is important. It allows continued monitoring of the benefit/risk balance of the medicinal product. Healthcare professionals are asked to report any suspected adverse reactions via the Pharmacy and Poisons Board online reporting portal (https://pv.pharmacyboardkenya.org/) or the Yellow Card Scheme at www.mhra.gov.uk/yellowcard or search for MHRA Yellow Card in the Google Play or Apple App Store.

4.9 Overdose

Symptoms

There is a risk of liver injury (including fulminant hepatitis, hepatic failure, cholestatic hepatitis, cytolytic hepatitis), particularly in elderly subjects, in young children, in patients with liver disease, in cases of chronic alcoholism, in patients with chronic malnutrition, and patients receiving enzyme inducers. Overdosing may be fatal in these cases.

Symptoms generally appear within the first 24 hours and comprise: nausea, vomiting, anorexia, pallor, and abdominal pain. Immediate emergency measures are necessary in case of paracetamol overdose, even when no symptoms are present.

Overdose, 7.5 g or more of paracetamol in a single administration in adults or 140 mg/kg of body weight in a single administration in children, causes hepatic cytolysis likely to induce complete and irreversible necrosis, resulting in hepatocellular insufficiency, metabolic acidosis, and encephalopathy, which may lead to coma and death. Simultaneously, increased levels of hepatic transaminases (AST, ALT), lactate dehydrogenase, and bilirubin are observed together with decreased prothrombin levels that may appear 12 to 48 hours after administration. Clinical symptoms of liver damage are usually evident initially after two days, and reach a maximum after 4 to 6 days.

Emergency measures

- Immediate hospitalisation.
- Before beginning treatment, take a blood sample for plasma paracetamol assay as soon as possible after the overdose.
- The treatment includes administration of the antidote, N-acetylcysteine (NAC) by the intravenous or oral route, if possible before the 10th hour. NAC can, however, give some degree of protection even after 10 hours, but in these cases, prolonged treatment is given.

Symptomatic treatment.

Hepatic tests must be carried out at the beginning of treatment and repeated every 24 hours. In most cases, hepatic transaminases restitution to normal in one to two weeks with full return of normal liver function. In very severe cases, however, liver transplantation may be necessary.

5. Pharmacological properties

5.1 Pharmacodynamic properties

Pharmacotherapeutic group: Analgesics; Other analgesics and antipyretics; Anilides.

ATC Code: N02BE01

Mechanism of action

The precise mechanism of the analgesic and antipyretic properties of paracetamol has still to be established; it may involve central and peripheral actions.

Pharmacodynamic effects

Paracetamol provides the onset of pain relief within 5 to 10 minutes after the start of administration. The peak analgesic effect is obtained in 1 hour, and the duration of this effect is usually 4 to 6 hours.

Paracetamol reduces fever within 30 minutes after the start of administration, with a duration of the antipyretic effect of at least 6 hours.

5.2 Pharmacokinetic properties

Adults

Absorption

Paracetamol pharmacokinetics is linear up to 2 g after single administration and after repeated administration during 24 hours. The bioavailability of paracetamol following infusion of 500mg and 1 g of Paracetamol 10 mg/ml Solution for Infusion is similar to that observed following infusion of 1g and 2 g propacetamol (containing 500mg and 1 g paracetamol, respectively). The maximal plasma concentration (Cmax) of paracetamol observed at the end of 15-minute intravenous infusion of 500mg and 1 g of Paracetamol 10 mg/ml Solution for Infusion is about 15µg/ml and 30 µg/ml, respectively.

Distribution

The volume of distribution of paracetamol is approximately 1 L/kg. Paracetamol is not extensively bound to plasma proteins.
Following infusion of 1 g paracetamol, significant concentrations of paracetamol (about 1.5
µg/mL) were observed in the cerebrospinal fluid at and after the 20th minute following infusion.

Biotransformation

Paracetamol is metabolised mainly in the liver following two major hepatic pathways: glucuronic acid conjugation and sulfuric acid conjugation. The latter route is rapidly saturable at doses that exceed the therapeutic doses. A small fraction (less than 4%) is metabolised by cytochrome P450 to a reactive intermediate (N-acetyl benzoquinone imine) which, under normal conditions of use, is rapidly detoxified by reduced glutathione and eliminated in the urine after conjugation with cysteine and mercapturic acid. However, during massive overdosing, the quantity of this toxic metabolite is increased.

Elimination

The metabolites of paracetamol are mainly excreted in the urine. 90% of the dose administered is excreted within 24 hours, mainly as glucuronide (60-80%) and sulfate (20- 30%) conjugates. Less than 5% is eliminated unchanged. Plasma half-life is 2.7 hours, and total body clearance is 18 L/h.

Neonates, infants, and children

The pharmacokinetic parameters of paracetamol observed in infants and children are similar to those observed in adults, except for the plasma half-life, which is slightly shorter (1.5 to 2 h) than in adults. In neonates, the plasma half-life is longer than in infants, i.e., around 3.5 hours. Neonates, infants, and children up to 10 years old excrete significantly less glucuronide and more sulfate conjugates than adults.

Table - Age-related pharmacokinetic values (standardised clearance, *CLstd/Foral (L.h-1 70 kg-1)

Age	**Weight (kg)**	**CLstd /Foral (L.h-1 70kg-1)**
40 weeks post-conception	3.3	5.9
3 months post-natal	6	8.8
6 months post-natal	7.5	11.1
1-year post-natal	10	13.6
2 years post-natal	12	15.6
5 years post-natal	20	16.3
8 years post-natal	25	16.3

*CLstd is the population estimate for CL

Special populations

Renal insufficiency

In cases of severe renal impairment (creatinine clearance 10-30 mL/min), the elimination of paracetamol is slightly delayed, the elimination half-life ranging from 2 to 5.3 hours. For the glucuronide and sulfate conjugates, the elimination rate is 3 times slower in subjects with severe renal impairment than in healthy subjects. Therefore, when giving paracetamol to patients with severe renal impairment (creatinine clearance ≤30 mL/min), the minimum interval between each administration should be increased to 6 hours. Posology and method of administration.

Elderly subjects

The pharmacokinetics and the metabolism of paracetamol are not modified in elderly subjects. No dose adjustment is required in this population.

5.3 Preclinical safety data

Preclinical data reveal no special hazard for humans beyond the information included in other sections of the SmPC.

Studies on local tolerance of Paracetamol 10 mg/ml Solution for Infusion in rats and rabbits showed good tolerability.

Absence of delayed contact hypersensitivity has been tested in guinea pigs.

Conventional studies using the currently accepted standards for the evaluation of toxicity to reproduction and development are not available.

6. Pharmaceutical Particulars

6.1 List of Excipients

Mannitol
Anhydrous Disodium Hydrogen Phosphate Hydrochloric acid
Water for Injections

6.2 Incompatibilities

Paracetamol must not be mixed with other medicinal products except those mentioned in section 6.6.

6.3 Shelf-Life

Unopened: 36 months.

After first opening*:* The infusion should commence immediately after connecting the container to the giving set.

After dilution*:* Chemical and physical in-use stability in the solutions listed in section 6.6 has been demonstrated for 4 hours at 30°C.

From a microbiological point of view, the product should be used immediately. If not used immediately, in-use storage times and conditions prior to use are the responsibility of the user.

6.4 Special precautions for storage

Store below 30°C.

Keep the vial in the outer carton to protect it from light.

Do not refrigerate or freeze.

6.5 Nature and content of the container

100ml solution filled in a PE Bottle affixed with a coded label which has a batch number, manufacturing date, and expiry dates, packed in a unit box with an insert.

6.6 Special precautions for disposal and other handling

Paracetamol can be diluted in a 0.9% sodium chloride solution or a 5% glucose solution up to one-tenth.

For shelf life after dilution, see section 6.3.

For single use only. Any unused solution should be discarded.

The medicinal product is to be inspected visually for particulate matter and discolouration before administration.

The diluted solution should be visually inspected and should not be used in the presence of opalescence, visible particulate matter, or precipitate.

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

7. Marketing Authorization Holder

GOODMED PHARMACY LTD.
Hass Plaza, Lower Hill Road,
P.O. Box 76337-00508
Nairobi, Kenya.

8. Marketing Authorization Number

CTD10537

9. Date of first authorization/renewal of the authorization

07/02/2025

10. Date of revision of the text

07/05/2025