

SUMMARY OF PRODUCT CHARACTERISTICS

1. NAME OF THE MEDICINAL PRODUCT

Paracetamol Kabi 10 mg/ml solution for infusion

2. QUALITATIVE AND QUANTITATIVE COMPOSITION

1 ml contains 10 mg paracetamol.
Each 50 ml vial contains 500 mg paracetamol.
Each 100 ml vial contains 1000 mg paracetamol.

For the full list of excipients, see section 6.1.

3. PHARMACEUTICAL FORM

Solution for infusion
Clear and slightly yellowish solution.
The solution is iso-osmotic and its pH is between 5.0 and 7.0.

4. CLINICAL PARTICULARS

4.1 Therapeutic indications

Paracetamol Kabi is indicated for:

- the short-term treatment of moderate pain, especially following surgery,
- 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

Intravenous use.

The 100 ml vial is restricted to adults, adolescents and children weighing more than 33 kg.

The 50 ml vial is restricted to term newborn infants, infants, toddlers and children weighing up to 33 kg.

Posology:

Body weight or age	Single dose	Maximum daily dose (taking all medicinal products containing paracetamol into account)
Pre-term newborn infants	No safety and efficacy data are available for pre-term newborn infants (see section 5.2).	
Term newborn infants, infants, toddlers and children weighing up to 10 kg (up to approximately 1 year old)	7.5 mg/kg paracetamol per administration i.e. 0.75 ml solution per kg	<ul style="list-style-type: none"> - Up to four times a day - The minimum interval between each administration must be 4 hours - The maximum daily dose must not exceed 30 mg/kg
Children weighing more than 10 kg (approximately 1 year old) and up to 33 kg	15 mg/kg paracetamol per administration, i.e. 1.5 ml solution per kg	<ul style="list-style-type: none"> - Up to four times a day - The minimum interval between each administration must be 4 hours - The maximum daily dose must not exceed 60 mg/kg (i.e. maximum daily dose 2 g)
Children weighing more than 33 kg (approximately 11 years old), adolescents and adults weighing up to 50 kg	15 mg/kg paracetamol per administration, i.e. 1.5 ml solution per kg	<ul style="list-style-type: none"> - Up to four times a day - The minimum interval between each administration must be 4 hours - The maximum daily dose must not exceed 60 mg/kg (i.e. maximum daily dose 3 g)
Adolescents and adults weighing more than 50 kg	1 g paracetamol per administration, i.e. one 100 ml vial	<ul style="list-style-type: none"> - Up to four times a day - The minimum interval between each administration must be 4 hours - The maximum daily dose must not exceed 4 g

Severe renal impairment

It is recommended, when giving paracetamol to patients with severe renal impairment (creatinine clearance ≤ 30 ml/min), to 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), dehydration

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

Method of administration:

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

Before administration, the product should be visually inspected for any particulate matter and discolouration.

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

For dilution of Paracetamol Kabi 10 mg/ml solution for infusion see section 6.6.

4.3 Contraindications

- Hypersensitivity to the active substance, propacetamol hydrochloride (prodrug of paracetamol) or to any of the excipients
- Severe hepatocellular insufficiency (Child-Pugh >9)

4.4 Special warnings and precautions for use

It is recommended to use a suitable analgesic oral treatment as soon as this route of administration is possible.

In order to avoid the risk of overdose, check that no other medicinal products administered do contain paracetamol or propacetamol hydrochloride.

Doses higher than those recommended entail the risk of very serious liver damage. Clinical signs and symptoms of hepatic damage (including fulminant hepatitis, hepatic failure, cholestatic hepatitis, cytolytic hepatitis) are not usually seen until two days, and up to a maximum of 4-6 days, after administration. Treatment with antidote should be given as soon as possible (see section 4.9).

Paracetamol should be used with particular caution under the following circumstances:

- Hepatocellular insufficiency (Child-Pugh \leq 9)
- Meulengracht Gilbert Syndrome (familial non-haemolytic jaundice)
- Severe renal insufficiency (creatinine clearance \leq 30 ml/min), see sections 4.2 and 5.2
- Chronic alcohol abuse
- Chronic malnutrition (low reserves of hepatic glutathione)
- In 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.
- Dehydration

Effects on laboratory tests

Paracetamol can affect tests for uric acid using phosphotungstic acid and blood sugar tests using glucose-oxidase-peroxidase.

4.5 Interaction with other medicinal products and other forms of interaction

- Probenecid causes an almost 2-fold reduction in 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.
- The metabolism of paracetamol is impaired in patients taking enzyme-inducing medicinal products such as rifampicin, barbiturates, tricyclic antidepressants, and some antiepileptics (carbamazepine, phenytoin, phenobarbital, primidone).

- Isolated reports describe unexpected hepatotoxicity in patients taking alcohol or enzyme-inducing medicinal products (see section 4.9).
- Concurrent administration of paracetamol and chloramphenicol may prolong the action of chloramphenicol.
- Concurrent administration of paracetamol and AZT (zidovudine) enhances the tendency to neutropenia.
- Concurrent administration of paracetamol and oral contraceptives may reduce the elimination half-life of paracetamol.
- Concomitant use of paracetamol (4 g per day for at least 4 days) with oral anticoagulants may lead to slight variations of 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.

4.6 Fertility, 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.

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 foetotoxic effects. Nevertheless, Paracetamol Kabi 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, Paracetamol Kabi may be used in breast-feeding women.

4.7 Effects on ability to drive and use machines

Paracetamol Kabi has no influence on the ability to drive and use machines.

4.8 Undesirable effects

The evaluation of undesirable effects is based on the following definition of frequency:

Very common	$\geq 1/10$
Common	$\geq 1/100$ to $< 1/10$
Uncommon	$\geq 1/1,000$ to $< 1/100$
Rare	$\geq 1/10,000$ to $< 1/1,000$
Very rare	$< 1/10,000$
Not known	Frequency cannot be estimated from the available data

As with all paracetamol containing medicinal products, undesirable effects are rare or very rare. They are described in the following table:

System organ class	Rare	Very rare	Not known
Blood and lymphatic system disorders		Thrombocytopenia, leukopenia, neutropenia, agranulocytosis	
Immune system disorders		Hypersensitivity (ranging from simple skin rash or urticaria to anaphylactic shock which requires immediate discontinuation of treatment), bronchospasm	
Cardiac disorders			Tachycardia
Vascular disorders	Hypotension		
Skin and subcutaneous tissue disorders			Erythema, flushing, pruritus
General disorders and administration site conditions	Malaise		
Investigations	Transaminases increased		

4.9 Overdose

At particular risk for hepatic damage (including fulminant hepatitis, hepatic failure, cholestatic hepatitis, cytolytic hepatitis) are elderly patients, young children, patients with hepatic disorders, chronic alcoholism, chronic malnutrition and patients concurrently receiving medicinal products that lead to enzyme induction. In such cases, overdose may be fatal.

Symptoms of overdose

Symptoms generally appear within the first 24 hours and comprise: nausea, vomiting, anorexia, pallor and abdominal pain.

Overdose with 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 paediatric patients, leads to hepatic cell necrosis, which can cause complete and irreversible necrosis and subsequently hepatocellular insufficiency, metabolic acidosis and encephalopathy. This, in turn, can lead to coma, sometimes with fatal outcome. Simultaneously, increased levels of hepatic transaminases (AST, ALT), lactate dehydrogenase and bilirubin in combination with decreased prothrombin levels are observed, which may occur 12 to 48 hours after administration.

Clinical symptoms of hepatic damage are usually evident after two days, and reach a maximum after 4 to 6 days.

Treatment of overdose

- Immediate hospitalisation
- Before initiating treatment, and as soon as possible following the overdose, a blood sample for determination of plasma paracetamol levels should be taken.

- The treatment includes administration of the antidote, N-acetylcysteine (NAC) either by the intravenous or the oral route, if possible during the first 10 hours. N-acetylcysteine can also offer some degree of protection even after 10 hours, but in this case prolonged treatment will be required.
- Symptomatic treatment
- Liver function tests must be carried out at the beginning of treatment and repeated every 24 hours. Usually hepatic transaminases return to normal in one to two weeks with full recovery of normal liver function. In very severe cases, however, liver transplantation may be necessary.
- Haemodialysis can reduce the plasma paracetamol concentration, but the effects are limited.

5. PHARMACOLOGICAL PROPERTIES

5.1 Pharmacodynamic properties

Pharmacotherapeutic group: Other analgesics and antipyretics, anilides, ATC code: N02BE01

The precise analgesic and antipyretic mode of action of paracetamol has not been established. A central and peripheral effect is likely.

Paracetamol Kabi provides onset of pain relief within 5 to 10 minutes following administration. The peak analgesic effect is obtained within 1 hour and analgesia usually persists 4 to 6 hours.

Paracetamol Kabi reduces fever within 30 minutes following administration. The antipyretic effect persists for at least 6 hours.

5.2 Pharmacokinetic properties

Adults

Absorption

Following single and repeated administration during 24 hours paracetamol pharmacokinetics is linear up to 2 g.

Bioavailability of paracetamol following infusion of 500 mg and 1 g of paracetamol is similar to that observed following infusion of 1 g and 2 g propacetamol (corresponding to 500 mg and 1 g paracetamol), respectively. The maximal plasma concentration (C_{max}) of paracetamol observed at the end of a 15-minute intravenous infusion of 500 mg and 1 g of paracetamol is about 15 µg/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 (about 10 %). Twenty minutes following infusion of 1 g paracetamol, significant concentrations of paracetamol (about 1.5 µg/ml) were observed in the cerebrospinal fluid.

Biotransformation

Paracetamol is mainly metabolised in the liver following two major hepatic pathways: conjugation with glucuronic acid and sulphuric acid. At doses that exceed the therapeutic dose, the latter route is rapidly saturated. A small fraction (less than 4 %) is metabolised by cytochrome P450 to a reactive intermediate (N-acetyl benzoquinone imine) which, with normal dosing, is rapidly detoxified by reduced glutathione and eliminated in the urine after conjugation with cysteine and mercapturic acid. However, in the event of massive overdose, 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 sulphate (20-30 %) conjugates. Less than 5 % is eliminated unchanged. Plasma half-life is 2.7 hours and total body clearance is 18 l/h.

Newborn infants, 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 that is slightly shorter (1.5 to 2 hours) than in adults. In newborn infants, the plasma half-life is longer than in infants, i.e. around 3.5 hours. Newborn infants, infants and children up to 10 years excrete significantly less glucuronide and more sulphate conjugates than adults.

Table: Age related pharmacokinetic values (standardised clearance, *CL_{std}/F_{oral} (l.h⁻¹ 70 kg⁻¹))

Age	Weight (kg)	CL_{std}/F_{oral} (l.h⁻¹ 70 kg⁻¹)
40 weeks (age post conception)	3.3	5.9
3 months (age postnatal)	6	8.8
6 months (age postnatal)	7.5	11.1
1 year (age postnatal)	10	13.6
2 years (age postnatal)	12	15.6
5 years (age postnatal)	20	16.3
8 years (age postnatal)	25	16.3

*CL_{std} is the population estimate for CL

Special population

Renal insufficiency

In 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 sulphate conjugates, the elimination rate is 3 times lower 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 (see section 4.2).

Elderly

The pharmacokinetics and metabolism of paracetamol are not altered in elderly. No dose adjustment is required in this patient 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 solution for infusion in rats and rabbits showed good tolerability. Absence of delayed contact hypersensitivity has been tested in guinea pigs.

6. PHARMACEUTICAL PARTICULARS

6.1 List of excipients

Cysteine
Mannitol (E421)
Water for injections

6.2 Incompatibilities

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

6.3 Shelf life

Vial before opening

50 ml: 24 months
100 ml: 36 months

After first opening

Chemical and physical in-use stability has been demonstrated for 6 hours at room temperature.

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 and would normally not be longer than 24 hours at 2 to 8 °C, unless opening and storage have taken place in controlled and validated aseptic conditions.

If diluted in sodium chloride 9 mg/ml (0.9 %) solution or 50 mg/ml glucose (5 %) solution, the solution should also be used immediately.

However, if the diluted solution is not used immediately, do not store for more than 6 hours (infusion time included).

6.4 Special precautions for storage

Do not refrigerate or freeze.

For storage conditions of the diluted medicinal product, see section 6.3

6.5 Nature and contents of container

50 ml and 100 ml Type II glass vials closed with halobutyl stoppers and aluminium/plastic flip-off caps.

Pack sizes:

1 vial
10 vials
12 vials
20 vials.

Not all pack sizes may be marketed.

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

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 infusion route. This monitoring at the end of the infusion applies particularly for central route infusions, in order to avoid air embolism.

Compatibility

Paracetamol Kabi 10 mg/ml solution for infusion can be diluted in sodium chloride 9 mg/ml (0.9 %) solution or 50 mg/ml glucose (5 %) solution up to one tenth.

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

Disposal

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

7. MARKETING AUTHORISATION HOLDER

[To be completed nationally]

8. MARKETING AUTHORISATION NUMBER(S)

[To be completed nationally]

9. DATE OF FIRST AUTHORISATION/RENEWAL OF THE AUTHORISATION

[To be completed nationally]

10. DATE OF REVISION OF THE TEXT

[To be completed nationally]