

# Summary of Product Characteristics

## 1 NAME OF THE MEDICINAL PRODUCT

Tipuric 100 mg Tablets

## 2 QUALITATIVE AND QUANTITATIVE COMPOSITION

Each tablet contains 100mg Allopurinol

### Excipient(s) with known effect

Lactose monohydrate 100mg

For the full list of excipients, see section 6.1.

## 3 PHARMACEUTICAL FORM

Tablet.

White, circular, biconvex tablet, 9.5 mm in diameter, marked with a single breakline and the code 230 on one side with the Clonmel logo on the reverse.

The score line is only to facilitate breaking for ease of swallowing and not to divide into equal doses.

## 4 CLINICAL PARTICULARS

### 4.1 Therapeutic Indications

Allopurinol is indicated for reducing urate/uric acid formation in conditions where urate/uric acid deposition has already occurred (e.g. gouty arthritis, skin tophi, nephrolithiasis) or is a predictable clinical risk (e.g. treatment of malignancy potentially leading to acute uric acid nephropathy).

The main clinical conditions where urate/uric acid deposition may occur are:

- Idiopathic gout.
- Uric acid lithiasis.
- Acute uric acid nephropathy.
- Neoplastic disease and myeloproliferative disease with high cell turnover rates, in which high urate levels occur either spontaneously, or after cytotoxic therapy.
- Certain enzyme disorders which lead to overproduction of urate for example:
  - Hypoxanthine-guanine phosphoribosyltransferase, including Lesch-Nyhan syndrome;
  - Glucose-6-phosphatase including glycogen storage disease;
  - Phosphoribosylpyrophosphate synthetase;
  - Phosphoribosylpyrophosphate amidotransferase;
  - Adenine phosphoribosyltransferase.

Allopurinol is indicated for the management of 2, 8-dihydroxyadenine (2, 8-DHA) renal stones related to deficient activity of adenine phosphoribosyltransferase.

Allopurinol is indicated for the management of recurrent mixed calcium oxalate renal stones in the presence of hyperuricosuria, when fluid, dietary and similar measures have failed.

## 4.2 Posology and method of administration

### Posology

#### *Adults:*

Allopurinol should be introduced at low dosage e.g. 100 mg/day to reduce the risk of adverse reactions and increased only if the serum urate response is unsatisfactory. Extra caution should be exercised if renal function is poor (see Dosage in renal impairment).

The following dosage schedules are suggested:

- 100 to 200 mg daily in mild conditions,
- 300 to 600 mg daily in moderately severe conditions,
- 700 to 900 mg daily in severe conditions.

Dosage higher than 300 mg should be given in divided doses not exceeding 300 mg at any time. If dosage on mg/kg bodyweight basis is required, 2-10 mg/kg bodyweight/day should be used.

#### *Paediatric population:*

Children under 15 years: 10 to 20 mg/kg bodyweight/day up to a maximum of 400 mg daily. Use in children is rarely indicated, except in malignant conditions (especially leukaemia) and certain enzyme disorders such as Lesch-Nyhan syndrome.

#### *Dosage in the elderly:*

In the absence of specific data, the lowest dosage which produces satisfactory urate reduction should be used. Particular attention should be paid to advice in 'Dosage in renal impairment' and 'Special warnings and precautions for use'.

#### *Dosage in renal impairment:*

Since allopurinol and its metabolites are excreted by the kidney, impaired renal function may lead to retention of the drug and/or its metabolites with consequent prolongation of plasma half-lives. In severe renal insufficiency, it may be advisable to use less than 100 mg per day or to use single doses of 100 mg at longer intervals than one day.

If facilities are available to monitor plasma oxipurinol concentrations, the dose should be adjusted to maintain plasma oxipurinol levels below 100 micromol/litre (15.2 mg/litre).

Allopurinol and its metabolites are removed by renal dialysis. If dialysis is required two or three times a week, consideration should be given to an alternative dosage schedule of 300 – 400 mg allopurinol immediately after each dialysis with none in the interim.

#### *Dosage in hepatic impairment:*

Reduced doses should be used in patients with hepatic impairment. Periodic liver function tests are recommended during the early stages of therapy.

#### *Treatment of high urate turnover conditions, e.g. neoplasia, Lesh-Nyhan syndrome:*

It is advisable to correct existing hyperuricaemia and/or hyperuricosuria with allopurinol before starting cytotoxic therapy. It is important to ensure adequate hydration to maintain optimum diuresis and to attempt alkalinisation of urine to increase solubility of urinary urate/uric acid. Dosage of allopurinol should be at the lower end of the recommended dosage schedule.

If urate nephropathy or other pathology has compromised renal function, the advice given in 'Dosage in renal impairment' should be followed.

These steps may reduce the risk of xanthine and/or oxipurinol deposition complicating the clinical situation. See also 'Interaction with other medicinal products and other forms of interaction' and 'Undesirable effects'.

#### *Monitoring Advice:*

The dosage should be adjusted by monitoring serum urate concentrations and urinary urate/uric acid levels at appropriate intervals.

#### Method of administration:

Allopurinol may be taken orally once a day after a meal. It is well tolerated, especially after food. Should the daily dosage exceed 300 mg and gastrointestinal intolerance be manifested, a divided dose regimen may be appropriate.

### **4.3 Contraindications**

Hypersensitivity to the active substance or to any of the excipients listed in section 6.1. Allopurinol is contraindicated as a treatment for the acute attack of gout and use in patients who are breast feeding infants. Prophylactic therapy may be started when the acute attack has completely subsided, provided anti-inflammatory agents are also taken.

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

#### Hypersensitivity syndrome, SJS and TEN:

Allopurinol hypersensitivity reactions can manifest in many different ways, including maculopapular exanthema, hypersensitivity syndrome (also known as DRESS) as well as life-threatening skin reactions (Stevens-Johnson syndrome (SJS) and toxic epidermal necrolysis (TEN)). These reactions are clinical diagnoses, and their clinical presentations remain the basis for decision making. If such reactions occur at any time during treatment, allopurinol should be withdrawn immediately. Rechallenge should not be undertaken in patients with hypersensitivity syndrome and SJS/TEN. Corticosteroids may be beneficial in overcoming hypersensitivity skin reactions.

Patients should be advised of the signs and symptoms and monitored closely for skin reactions. The highest risk for occurrence of SJS or TEN is within the first weeks of treatment.

The best results in managing SJS and TEN come from early diagnosis and immediate discontinuation of any suspect drug. Early withdrawal is associated with a better prognosis.

#### HLA-B\*5801 allele:

The HLA-B\*5801 allele has been shown to be associated with the risk of developing allopurinol related hypersensitivity syndrome and SJS/TEN. The frequency of the HLA-B\*5801 allele varies widely between ethnic populations: up to 20% in Han Chinese population, 8-15% in the Thai, about 12% in the Korean population and 1-2% in individuals of Japanese or European origin. Screening for HLA-B\*5801 should be considered before starting treatment with allopurinol in patient subgroups where the prevalence of this allele is known to be high. Chronic kidney disease may increase the risk in these patients additionally. In case that no HLA-B\*5801 genotyping is available for patients with Han Chinese, Thai or Korean descent the benefits should be thoroughly assessed and considered outweigh the possible higher risks before starting therapy. The use of genotyping has not been established in other patient populations. If the patient is a known carrier of HLA-B\*5801 (especially in those who are from Han Chinese, Thai or Korean descent), allopurinol should not be started unless there are no other reasonable therapeutic options and the benefits are thought to exceed risks. Extra vigilance for signs of hypersensitivity syndrome or SJS/TEN is required and the patient should be informed of the need to stop treatment immediately at the first appearance of symptoms.

SJS/TEN can still occur in patients who are found to be negative for HLA-B\*5801 irrespective of their ethnic origin.

#### Thyroid disorders

Increased TSH values (>5.5 µIU/mL) were observed in patients on long-term treatment with allopurinol (5.8%) in a long term open label extension study. Caution is required when allopurinol is used in patients with alteration of thyroid function.

Reduced doses should be used in patients with hepatic or renal impairment.

Patients under treatment for hypertension or cardiac insufficiency, for example with diuretics or ACE inhibitors, may have some concomitant impairment of renal function and allopurinol should be used with care in this group.

Chronic renal insufficiency and concomitant diuretic use, in particular thiazides, has been associated with an increased risk of allopurinol induced SJS/TEN, and other serious hypersensitivity reactions.

Asymptomatic hyperuricaemia per se is generally not considered an indication for use of allopurinol. Fluid and dietary modification with management of the underlying cause may correct the condition.

Acute gouty attacks:

Allopurinol treatment should not be started until an acute attack of gout has completely subsided, as further attacks may be precipitated.

In the early stages of treatment with allopurinol, as with uricosuric agents, an acute attack of gouty arthritis may be precipitated. Therefore it is advisable to give prophylaxis with a suitable anti-inflammatory agent or colchicine for at least one month. The literature should be consulted for details of appropriate dosage and precautions and warnings.

If acute attacks develop in patients receiving allopurinol, treatment should continue at the same dosage while the acute attack is treated with a suitable anti-inflammatory agent.

Xanthine deposition:

In conditions where the rate of urate formation is greatly increased (e.g. malignant disease and its treatment, Lesch-Nyhan Syndrome) the absolute concentration of xanthine in urine could, in rare cases, rise sufficiently to allow deposition in the urinary tract. This risk may be minimised by adequate hydration to achieve optimal urine dilution.

Impaction of uric acid renal stones:

Adequate therapy with allopurinol will lead to dissolution of large uric acid renal pelvic stones, with the remote possibility of impaction in the ureter.

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

## **4.5 Interaction with other medicinal products and other forms of interaction**

6-mercaptopurine and azathioprine:

Azathioprine is metabolised as 6-mercaptopurine which is inactivated by the action of xanthine oxidase. When 6-mercaptopurine or azathioprine is given concurrently with allopurinol, only one-quarter of the usual dose of 6-mercaptopurine or azathioprine should be given because inhibition of xanthine oxidase will prolong their activity.

Vidarabine (Adenine arabinoside):

Evidence suggests that the plasma half-life of vidarabine is increased in the presence of allopurinol. When the two products are used concomitantly extra vigilance is necessary, to recognise enhanced toxic effects.

Salicylates and uricosuric agents:

Oxipurinol, the metabolite of allopurinol and itself therapeutically active, is excreted by the kidney in a similar way to urate. Hence, drugs with uricosuric activity such as probenecid or large doses of salicylate may accelerate the excretion of oxipurinol. This may decrease the therapeutic activity of allopurinol, but the significance needs to be assessed in each case.

Chlorpropamide:

If allopurinol is given concomitantly with chlorpropamide when renal function is poor, there may be an increased risk of prolonged hypoglycaemic activity because allopurinol and chlorpropamide may compete for excretion in the renal tubule.

Coumarin anticoagulants:

There have been rare reports of increased effect of warfarin and other coumarin anticoagulants when co-administered with allopurinol, therefore, all patients receiving anticoagulants must be carefully monitored.

#### Phenytoin:

Allopurinol may inhibit hepatic oxidation of phenytoin but the clinical significance has not been demonstrated.

#### Theophylline:

Inhibition of the metabolism of theophylline has been reported. The mechanism of the interaction may be explained by xanthine oxidase being involved in the biotransformation of theophylline in man. Theophylline levels should be monitored in patients starting or increasing allopurinol therapy.

#### Ampicillin/amoxicillin:

An increase in the frequency of skin rash has been reported among patients receiving ampicillin or amoxicillin concurrently with allopurinol compared to patients who are not receiving both drugs. The cause of the reported association has not been established. However, it is recommended that in patients receiving allopurinol an alternative to ampicillin or amoxicillin is used where available.

#### Cyclophosphamide, doxorubicin, bleomycin, procarbazine, mechloroethamine:

Enhanced bone marrow suppression by cyclophosphamide and other cytotoxic agents has been reported among patients with neoplastic disease (other than leukaemia), in the presence of allopurinol. However in a well-controlled study of patients treated with cyclophosphamide, doxorubicin, bleomycin, procarbazine and/or mechloroethamine (mustine hydrochloride) allopurinol did not appear to increase the toxic reaction of these cytotoxic agents.

#### Ciclosporin:

Reports suggest that the plasma concentration of ciclosporin may be increased during concomitant treatment with allopurinol. The possibility of enhanced ciclosporin toxicity should be considered if the drugs are co-administered.

#### Cytostatics:

With administration of allopurinol and cytostatics (e.g. cyclophosphamide, doxorubicin, bleomycin, procarbazine, alkyl halogenides), blood dyscrasias occur more frequently than when these active substances are administered alone.

Blood count monitoring should therefore be performed at regular intervals.

#### Didanosine

In healthy volunteers and HIV patients receiving didanosine, plasma didanosine  $C_{max}$  and AUC values were approximately doubled with concomitant allopurinol treatment (300 mg daily) without affecting terminal half life. Therefore, dose reductions of didanosine may be required when used concomitantly with allopurinol.

#### Diuretics

An interaction between allopurinol and furosemide that results in increased serum urate and plasma oxipurinol concentrations has been reported. An increased risk of hypersensitivity has been reported when allopurinol is given with diuretics, in particular thiazides, especially in renal impairment.

#### Angiotensin-converting-enzyme (ACE) inhibitors.

An increased risk of skin reactions and hypersensitivity has been reported when allopurinol is given with ACE inhibitors especially in renal impairment.

#### Aluminium hydroxide

If aluminium hydroxide is taken concomitantly, allopurinol may have an attenuated effect. There should be an interval of at least 3 hours between taking both medicines.

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

#### Pregnancy:

There is inadequate evidence of safety of allopurinol in human pregnancy, although it has been in wide use for many years without apparent ill consequence.

Use in pregnancy only when there is no safer alternative and when the disease itself carries risks for the mother or unborn child.

**Breast-feeding:**

Allopurinol and its metabolite oxipurinol is excreted in the human breast milk. Allopurinol during breastfeeding is not recommended.

**4.7 Effects on ability to drive and use machines**

Since adverse reactions such as somnolence, vertigo and ataxia have been reported in patients receiving allopurinol, patients should exercise caution before driving, using machinery or participating in dangerous activities until they are reasonably certain that allopurinol does not adversely affect performance.

**4.8 Undesirable effects**

For this product there is no modern clinical documentation which can be used as support for determining the frequency of undesirable effects. Undesirable effects may vary in their incidence depending on the dose received and also when given in combination with other therapeutic agents.

The frequency categories assigned to the adverse drug reactions below are estimates: for most reactions, suitable data for calculating incidence are not available. Adverse drug reactions identified through post-marketing surveillance were considered to be rare or very rare. The following convention has been used for the classification of frequency:

|             |  |
|-------------|--|
| Very common | $\geq 1/10$ ( $\geq 10\%$ )                                    |
| Common      | $\geq 1/100$ and $< 1/10$ ( $\geq 1\%$ and $< 10\%$ )          |
| Uncommon    | $\geq 1/1000$ and $< 1/100$ ( $\geq 0.1\%$ and $< 1\%$ )       |
| Rare        | $\geq 1/10,000$ and $< 1/1000$ ( $\geq 0.01\%$ and $< 0.1\%$ ) |
| Very rare   | $< 1/10,000$ ( $< 0.01\%$ )                                    |

At the start of treatment with allopurinol, patients may experience a reactive gout attack.

Adverse reactions in association with allopurinol are rare in the overall treated population and mostly of a minor nature. The incidence is higher in the presence of renal and/or hepatic disorder.

|  |   |
|--|---|
| <b>Infections and infestations</b>   |   |
| Very rare  | Furunculosis  |
| <b>Blood and lymphatic system disorders</b>  |   |
| Very rare  | Agranulocytosis, aplastic anaemia, thrombocytopenia |
| Very rare reports have been received of thrombocytopenia, agranulocytosis and aplastic anaemia, particularly in individuals with impaired renal and/or hepatic function, reinforcing the need for particular care in this group of patients.   |   |
| <b>Immune system disorders</b>   |   |
| Uncommon   | Hypersensitivity reactions                          |
| Very rare  | Angioimmunoblastic lymphadenopathy.                 |
| Serious hypersensitivity reactions, including skin reactions associated with exfoliation, fever, lymphadenopathy, arthralgia and/or eosinophilia including Stevens-Johnson Syndrome and Toxic Epidermal Necrolysis, occur rarely (see Skin and subcutaneous tissue disorders). Associated vasculitis and tissue response may be manifested in various ways including hepatitis, renal impairment and, very rarely, seizures. |   |

Very rarely acute anaphylactic shock has been reported. If such reactions do occur, it may be at any time during treatment. Allopurinol should be withdrawn IMMEDIATELY AND PERMANENTLY.

A delayed multi-organ hypersensitivity disorder (known as hypersensitivity syndrome or DRESS) with fever, rashes, vasculitis, lymphadenopathy, pseudo lymphoma, arthralgia, leucopenia, eosinophilia, hepato-splenomegaly, abnormal liver function tests and vanishing bile duct syndrome (destruction and disappearance of the intrahepatic bile ducts) occurring in various combinations. Other organs may also be affected (e.g. liver, lungs, kidneys, pancreas, myocardium, and colon). If such reactions do occur, it may be at any time during treatment, allopurinol should be withdrawn immediately and permanently.

Corticosteroids may be beneficial in overcoming hypersensitivity skin reactions. When generalised hypersensitivity reactions have occurred, renal and/or hepatic disorder has usually been present particularly when the outcome has been fatal.

Angioimmunoblastic lymphadenopathy has been described very rarely following biopsy of a generalised lymphadenopathy. It appears to be reversible on withdrawal of allopurinol.

#### **Metabolism and nutrition disorders**

|           |                                    |
|-----------|------------------------------------|
| Very rare | Diabetes mellitus, hyperlipidaemia |
|-----------|------------------------------------|

#### **Psychiatric disorders**

|           |            |
|-----------|------------|
| Very rare | Depression |
|-----------|------------|

#### **Nervous system disorders**

|           |  |
|-----------|--|
| Very rare | Coma, paralysis, ataxia, neuropathy, paraesthesiae, somnolence, headache, taste perversion |
|-----------|--|

#### **Eye disorders**

|           |  |
|-----------|--|
| Very rare | Cataract, visual disorder, macular changes |
|-----------|--|

#### **Ear and labyrinth disorders**

|           |         |
|-----------|---------|
| Very rare | Vertigo |
|-----------|---------|

#### **Cardiac disorders**

|           |                     |
|-----------|---------------------|
| Very rare | Angina, bradycardia |
|-----------|---------------------|

#### **Vascular disorders**

|           |              |
|-----------|--------------|
| Very rare | Hypertension |
|-----------|--------------|

#### **Gastrointestinal disorders**

|          |                  |
|----------|------------------|
| Uncommon | Vomiting, nausea |
|----------|------------------|

|           |   |
|-----------|---|
| Very rare | Recurrent haematemesis, steatorrhoea, stomatitis, changed bowel habit |
|-----------|---|

In early clinical studies, nausea and vomiting were reported. Further reports suggest that this reaction is not a significant problem and can be avoided by taking allopurinol after meals.

#### **Hepatobiliary disorders**

|          |  |
|----------|--|
| Uncommon | Asymptomatic increases in liver function tests |
|----------|--|

|  |  |
|--|--|
| Rare   | Hepatitis (including hepatic necrosis and granulomatous hepatitis) |
| Hepatic dysfunction has been reported without overt evidence of more generalised hypersensitivity.   |  |
| <b>Skin and subcutaneous tissue disorders</b>  |  |
| Common   | Rash   |
| Rare   | Stevens-Johnson syndrome/toxic epidermal necrolysis                |
| Very rare  | Angioedema, fixed drug eruption, alopecia, discoloured hair        |
| <p>Skin reactions are the most common reactions and may occur at any time during treatment.</p> <p>They may be pruritic, maculopapular, sometimes scaly, sometimes purpuric and rarely exfoliative, such as Stevens-Johnson syndrome and toxic epidermal necrolysis (SJS/TEN).</p> <p>Allopurinol should be withdrawn IMMEDIATELY should such reactions occur. After recovery from mild reactions, allopurinol may, if desired, be re-introduced at a small dose (e.g. 50 mg/day) and gradually increased.</p> <p>If the rash recurs, allopurinol should be PERMANENTLY withdrawn as more severe hypersensitivity reactions may occur (see Immune system disorders).</p> |  |
| Angioedema has been reported to occur with and without signs and symptoms of a more generalised allopurinol hypersensitivity reaction.   |  |
| <b>Renal and urinary disorders</b>   |  |
| Very rare  | Haematuria, uraemia  |
| <b>Reproductive system and breast disorders</b>  |  |
| Very rare  | Male infertility, erectile dysfunction, gynaecomastia              |
| <b>General disorders and administration site conditions</b>  |  |
| Very rare  | Oedema, general malaise, asthenia, fever                           |
| Fever has been reported to occur with and without signs and symptoms of a more generalised allopurinol hypersensitivity reaction (see Immune system disorders).  |  |
| <b>Investigations</b>  |  |
| Common   | blood thyroid stimulating hormone increased*                       |
| *The occurrence of increased thyroid stimulating hormone (TSH) in the relevant studies did not report any impact on free T4 levels or had TSH levels indicative of subclinical hypothyroidism.   |  |

#### Reporting of suspected adverse reactions

Reporting suspected adverse reactions after authorisation 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 HPRA Pharmacovigilance, Earlsfort Terrace, IRL - Dublin 2; Tel: +353 1 6764971; Fax: +353 1 6762517. Website: [www.hpra.ie](http://www.hpra.ie); E-mail: [medsafety@hpra.ie](mailto:medsafety@hpra.ie).

## 4.9 Overdose

#### Symptoms and signs

Ingestion of up to 22.5g allopurinol without adverse effect has been reported. Symptoms and signs including nausea, vomiting, diarrhoea and dizziness have been reported in a patient who ingested 20g allopurinol. Recovery followed general supportive measures.



### Management

Massive absorption of allopurinol may lead to considerable inhibition of xanthine oxidase activity, which should have no untoward effects unless affecting concomitant medication especially with 6-mercaptopurine and/or azathioprine. Adequate hydration to maintain optimum diuresis facilitates excretion of allopurinol and its metabolites. If considered necessary haemodialysis may be used.

## **5 PHARMACOLOGICAL PROPERTIES**

### **5.1 Pharmacodynamic properties**

Pharmacotherapeutic group: Preparations inhibiting uric acid production  
ATC code: M04AA01

#### Mechanism of action

Allopurinol and its main metabolite oxipurinol lower the level of uric acid in plasma and urine by inhibition of xanthine oxidase, the enzyme catalyzing the oxidation of hypoxanthine to xanthine and xanthine to uric acid.

In addition to the inhibition of purine catabolism, in some but not all hyperuricaemic patients, *de novo* purine biosynthesis is depressed via feedback inhibition of hypoxanthine-guanine phosphoribosyltransferase. Other metabolites of allopurinol include allopurinol-riboside and oxipurinol-7-riboside.

### **5.2 Pharmacokinetic properties**

Allopurinol is active when given orally and is rapidly absorbed from the upper gastrointestinal tract. Studies have detected allopurinol in the blood 30-60 minutes after dosing. Estimates of bioavailability vary from 67% to 90%. Peak plasma levels of allopurinol generally occur approximately 1.5 hours after oral administration of allopurinol, but fall rapidly and are barely detectable after 6 hours. Peak plasma levels of oxipurinol generally occur after 3-5 hours after oral administration of allopurinol and are much more sustained.

Allopurinol is negligibly bound by plasma proteins and therefore variations in protein binding are not thought to significantly alter clearance. The apparent volume of distribution of allopurinol is approximately 1.6 litre/kg which suggests relatively extensive uptake by tissues. Tissue concentrations of allopurinol have not been reported in humans, but it is likely that allopurinol and oxipurinol will be present in the highest concentrations in the liver and intestinal mucosa where xanthine oxidase activity is high.

Approximately 20% of the ingested allopurinol is excreted in the faeces. Elimination of allopurinol is mainly by metabolic conversion to oxipurinol by xanthine oxidase and aldehyde oxidase, with less than 10% of the unchanged drug excreted in the urine. Allopurinol has a plasma half-life of about 1 to 2 hours.

Oxipurinol is a less potent inhibitor of xanthine oxidase than allopurinol, but the plasma half-life of oxipurinol is far more prolonged. Estimates range from 13 to 30 hours in man. Therefore effective inhibition of xanthine oxidase is maintained over a 24 hour period with a single daily dose of allopurinol. Patients with normal renal function will gradually accumulate oxipurinol until a steady-state plasma oxipurinol concentration is reached. Such patients, taking 300mg of allopurinol per day will generally have plasma oxipurinol concentrations of 5-10 mg/litre.

Oxipurinol is eliminated unchanged in the urine but has a long elimination half-life because it undergoes tubular reabsorption. Reported values for the elimination half-life range from 13.6 hours to 29 hours. The large discrepancies in these values may be accounted for by variations in study design and/or creatinine clearance in the patients.

#### Pharmacokinetics in patients with renal impairment:

Allopurinol and oxipurinol clearance is greatly reduced in patients with poor renal function resulting in higher plasma levels in chronic therapy. Patients with renal impairment, where creatinine clearance values were between 10 and 20 ml/min, showed plasma oxipurinol concentrations of approximately 30 mg/litre after prolonged treatment with 300 mg allopurinol per day.

This is approximately the concentration which would be achieved by doses of 600 mg/day in those with normal renal function. A reduction in the dose of allopurinol is therefore required in patients with renal impairment.

#### Pharmacokinetics in elderly patients:

The kinetics of the drug are not likely to be altered other than due to deterioration in renal function (see Pharmacokinetics in patients with renal impairment).

### **5.3 Preclinical safety data**

#### *Mutagenicity*

Cytogenetic studies show that allopurinol does not induce chromosome aberrations in human blood cells *in vitro* at concentrations up to 100microgram/ml and *in vivo* at doses up to 600mg/day for a mean of 40 months.

Allopurinol does not produce nitroso compounds *in vitro* or affect lymphocyte transformation *in vitro*.

Evidence from biochemical and other cytological investigations strongly suggests that allopurinol has no deleterious effects on DNA at any stage of the cell cycle and is not mutagenic.

#### *Carcinogenicity*

No evidence of carcinogenicity has been found in mice and rats treated with allopurinol for up to 2 years.

#### *Teratogenicity*

One study in mice receiving intraperitoneal doses of 50 or 100mg/kg on days 10 or 13 of gestation resulted in foetal abnormalities, however in a similar study in rats at 120mg/kg on day 12 of gestation no abnormalities were observed. Extensive studies of high oral doses of allopurinol in mice up to 100mg/kg/day, rats up to 200mg/kg/day and rabbits up to 150mg/kg/day during days 8 to 16 of the gestation produced no teratogenic effects. An *in vitro* study using foetal mouse salivary glands in culture to detect embryotoxicity indicated that allopurinol would not be expected to cause embryotoxicity without also causing maternal toxicity.

## **6 PHARMACEUTICAL PARTICULARS**

### **6.1 List of excipients**

Lactose monohydrate  
Starch maize  
Povidone  
Crospovidone  
Magnesium stearate

### **6.2 Incompatibilities**

Not applicable.

### **6.3 Shelf life**

3 years.

### **6.4 Special precautions for storage**

Do not store above 25°C.  
Keep the container tightly closed.  
Store in the original container.

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

Polypropylene tubes with low density polyethylene caps. High density polyethylene film may be used as packing material.

Pack size: 30, 40, 50, 100, 250 and 500 tablets.

Not all pack sizes may be marketed.

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

No special requirements. Any unused medicinal product or waste material should be disposed of in accordance with local requirements.

## **7 MARKETING AUTHORISATION HOLDER**

Clonmel Healthcare Limited  
Waterford Road  
Clonmel  
Co. Tipperary

## **8 MARKETING AUTHORISATION NUMBER**

PA0126/038/001

## **9 DATE OF FIRST AUTHORISATION/RENEWAL OF THE AUTHORISATION**

Date of first authorisation: 27 July 1983

Date of last renewal: 27 July 2008

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

January 2018