

## **Casodex 50 mg**

*Bicalutamide*

**Film coated tablets**

### **Qualitative and quantitative composition**

Each tablet contains 50 mg bicalutamide (INN)

Excipient(s) with known effect:

Each tablet contains 61 mg lactose monohydrate.

For the full list of excipients, see section List of excipients

### **Pharmaceutical form**

White film-coated tablet.

### **Therapeutic indications**

Treatment of advanced prostate cancer in combination with luteinizing-hormone releasing hormone (LHRH) analogue therapy or surgical castration.

### **Posology and method of administration**

Adult males including the elderly: one tablet (50 mg) once a day.

Treatment with Casodex should be started at least 3 days before commencing treatment with an LHRH analogue, or at the same time as surgical castration.

Children: Casodex is contraindicated in children (see contraindications).

Renal impairment: no dosage adjustment is necessary for patients with renal impairment.

Hepatic impairment: no dosage adjustment is necessary for patients with mild hepatic impairment. Increased accumulation may occur in patients with moderate to severe hepatic impairment (see section Special warnings and precautions for use).

### **Contraindications**

Casodex is contraindicated in females and children (see section Fertility, pregnancy and lactation).

Casodex must not be given to any patient who has shown a hypersensitivity reaction to the active substance or to any of the excipients of this product.

Co-administration of terfenadine, astemizole or cisapride with Casodex is contraindicated (see section Interaction with other medicinal products and other forms of interaction).

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

Initiation of treatment should be under the direct supervision of a specialist.

Casodex is extensively metabolised in the liver. Data suggests that its elimination may be slower in subjects with severe hepatic impairment and this could lead to increased accumulation of Casodex. Therefore, Casodex should be used with caution in patients with moderate to severe hepatic impairment.

Periodic liver function testing should be considered due to the possibility of hepatic changes. The majority of changes are expected to occur within the first 6 months of Casodex therapy.

Severe hepatic changes and hepatic failure have been observed rarely with Casodex, and fatal outcomes have been reported (see section Undesirable effects). Casodex therapy should be discontinued if changes are severe.

A reduction in glucose tolerance has been observed in males receiving LHRH agonists. This may manifest as diabetes or loss of glycaemic control in those with pre-existing diabetes. Consideration should therefore be given to monitoring blood glucose in patients receiving Casodex in combination with LHRH agonists.

Casodex has been shown to inhibit cytochrome P450 (CYP 3A4), as such caution should be exercised when co-administered with drugs metabolised predominantly by CYP 3A4 (see sections Contraindications and Interaction with other medicinal products and other forms of interaction).

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

#### Androgen deprivation therapy may prolong the QT interval.

In patients with a history of or risk factors for QT prolongation and in patients receiving concomitant medicinal products that might prolong the QT interval (see section Interaction with other medicinal products and other forms of interaction) physicians should assess the benefit risk ratio including the potential for Torsade de pointes prior to initiating Casodex.

Antiandrogen therapy may cause morphological changes in spermatozoa. Although the effect of bicalutamide on sperm morphology has not been evaluated and no such changes have been reported for patients who received Casodex, patients and/or their partners should follow adequate contraception during and for 130 days after Casodex therapy.

Potentiation of coumarin anticoagulant effects have been reported in patients receiving concomitant Casodex therapy, which may result in increased Prothrombin Time (PT) and International Normalised Ratio (INR). Some cases have been associated with risk of bleeding. Close monitoring of PT/INR is advised and anticoagulant dose adjustment should be considered (see sections Interaction with other medicinal products and other forms of interaction & Undesirable effects).

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

There is no evidence of any pharmacodynamic or pharmacokinetic interactions between Casodex and LHRH analogues.

*In vitro* studies have shown that R-bicalutamide is an inhibitor of CYP 3A4, with lesser inhibitory effects on CYP 2C9, 2C19 and 2D6 activity.

Although clinical studies using antipyrine as a marker of cytochrome P450 (CYP) activity showed no evidence of a drug interaction potential with Casodex, mean midazolam exposure (AUC) was increased by up to 80%, after co-administration of Casodex for 28 days. For drugs with a narrow therapeutic index such an increase could be of relevance. As such, concomitant use of terfenadine, astemizole and cisapride is contraindicated (see section, Contraindications) and caution should be exercised with the co-administration of Casodex with compounds such as ciclosporin and calcium channel blockers. Dosage reduction may be required for these drugs particularly if there is evidence of enhanced or adverse drug effect. For ciclosporin, it is recommended that plasma concentrations and clinical condition are closely monitored following initiation or cessation of Casodex therapy.

Caution should be exercised when prescribing Casodex with other drugs which may inhibit drug oxidation e.g. cimetidine and ketoconazole. In theory, this could result in increased plasma concentrations of Casodex which theoretically could lead to an increase in side effects.

*In vitro* studies have shown that bicalutamide can displace the coumarin anticoagulant, warfarin, from its protein binding sites. There have been reports of increased effect of warfarin and other coumarin anticoagulants when co-administered with Casodex. It is therefore recommended that if Casodex is administered in patients who are concomitantly receiving coumarin anticoagulants, PT/INR should be closely monitored and adjustments of anticoagulant dose considered (see sections Special warnings and precautions for use & Undesirable effects).

Since androgen deprivation treatment may prolong the QT interval, the concomitant use of Casodex with medicinal products known to prolong the QT interval or medicinal products able to induce Torsade de pointes such as class IA (e.g. quinidine, disopyramide) or class III (e.g. amiodarone, sotalol, dofetilide, ibutilide) antiarrhythmic medicinal products, methadone, moxifloxacin, antipsychotics, etc. should be carefully evaluated (see section Special warnings and precautions for use).

#### Paediatric population

Interaction studies have only been performed in adults.

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

##### Pregnancy

Bicalutamide is contraindicated in females and must not be given to pregnant women.

##### Breast-feeding

Bicalutamide is contraindicated during breast-feeding.

##### Fertility

Reversible impairment of male fertility has been observed in animal studies (see section Preclinical safety data). A period of subfertility or infertility should be assumed in man.



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

Casodex is unlikely to impair the ability of patients to drive or operate machinery. However, it should be noted that occasionally somnolence may occur. Any affected patients should exercise caution.

**Undesirable effects**

In this section, undesirable effects are defined as follows: Very common ( $\geq 1/10$ ); common ( $\geq 1/100$  to  $< 1/10$ ); uncommon ( $\geq 1/1,000$  to  $\leq 1/100$ ); rare ( $\geq 1/10,000$  to  $\leq 1/1,000$ ); very rare ( $\leq 1/10,000$ ); not known (cannot be estimated from the available data).

**Table 1 Frequency of Adverse Reactions**

System Organ Class	Frequency	Event
Blood and lymphatic system disorders	Very common	Anaemia
Immune system disorders	Uncommon	Hypersensitivity, angioedema and urticaria
Metabolism and nutrition disorders	Common	Decreased appetite
Psychiatric disorders	Common	Decreased libido depression
Nervous system disorders	Very common	Dizziness
	Common	Somnolence
Cardiac disorders	Common	Myocardial infarction (fatal outcomes have been reported) <sup>4</sup> , cardiac failure <sup>4</sup>
	Not Known	QT prolongation (see sections Special warnings and precautions for use and Interaction with other medicinal products and other forms of interaction).
Vascular disorders	Very common	Hot flush
Respiratory, thoracic and mediastinal disorders	Uncommon	Interstitial lung disease <sup>5</sup> . Fatal outcomes have been reported.
Gastrointestinal disorders	Very common	Abdominal pain constipation Nausea
	Common	Dyspepsia flatulence
Hepato-biliary disorders	Common	Hepatotoxicity, jaundice, raised transaminases <sup>1</sup>
	Rare	Hepatic failure <sup>2</sup> . Fatal outcomes have been reported.
Skin and subcutaneous tissue disorders	Common	Alopecia hirsutism/hair re-growth dry skin pruritus rash
	Rare	Photosensitivity reaction

Renal and urinary disorders	Very common	Haematuria
Reproductive system and breast disorders	Very common	Gynaecomastia and breast tenderness <sup>3</sup>
	Common	Erectile dysfunction
General disorders and administration site conditions	Very common	Asthenia Oedema
	Common	Chest pain
Investigations	Common	Weight increased

1. Hepatic changes are rarely severe and were frequently transient, resolving or improving with continued therapy or following cessation of therapy.
2. Listed as an adverse drug reaction following review of post-marketed data. Frequency has been determined from the incidence of reported adverse events of hepatic failure in patients receiving treatment in the open-label Casodex arm of the 150 mg EPC studies.
3. May be reduced by concomitant castration.
4. Observed in a pharmaco-epidemiology study of LHRH agonists and anti-androgens used in the treatment of prostate cancer. The risk appeared to be increased when Casodex 50 mg was used in combination with LHRH agonists but no increase in risk was evident when Casodex 150 mg was used as a monotherapy to treat prostate cancer.
5. Listed as an adverse drug reaction following review of post-marketed data. Frequency has been determined from the incidence of reported adverse events of interstitial pneumonia in the randomised treatment period of the 150 mg EPC studies.

Increased PT/INR: Accounts of coumarin anticoagulants interacting with Casodex have been reported in post marketing surveillance (see sections Special warnings and precautions for use & Interaction with other medicinal products and other forms of interaction).

### Overdose

There is no human experience of overdosage. There is no specific antidote; treatment should be symptomatic. Dialysis may not be helpful, since Casodex is highly protein bound and is not recovered unchanged in the urine. General supportive care, including frequent monitoring of vital signs, is indicated.

### Pharmacological properties

#### Pharmacodynamic properties

Antiandrogen, ATC code L02 B B03

**Mechanism of action** Casodex is a non-steroidal antiandrogen, devoid of other endocrine activity. It binds to androgen receptors without activating gene expression, and thus inhibits the androgen stimulus. Regression of prostatic tumours results from this inhibition. Clinically, discontinuation of Casodex can result in antiandrogen withdrawal syndrome in a subset of patients.

Casodex is a racemate with its antiandrogenic activity being almost exclusively in the (R)-enantiomer.



### **Pharmacokinetic properties**

Casodex is well absorbed following oral administration. There is no evidence of any clinically relevant effect of food on bioavailability.

The (S)-enantiomer is rapidly cleared relative to the (R)-enantiomer, the latter having a plasma elimination half-life of about 1 week.

On daily administration of Casodex, the (R)-enantiomer accumulates about 10 fold in plasma as a consequence of its long half-life.

Steady state plasma concentrations of the (R)-enantiomer of approximately 9 microgram/ml are observed during daily administration of 50 mg doses of Casodex. At steady state the predominantly active (R)-enantiomer accounts for 99% of the total circulating enantiomers.

The pharmacokinetics of the (R)-enantiomer are unaffected by age, renal impairment or mild to moderate hepatic impairment. There is evidence that for subjects with severe hepatic impairment, the (R)-enantiomer is more slowly eliminated from plasma.

Casodex is highly protein bound (racemate 96% (R)-enantiomer >99%) and extensively metabolised (via oxidation and glucuronidation): Its metabolites are eliminated via the kidneys and bile in approximately equal proportions.

In a clinical study the mean concentration of R-bicalutamide in semen of men receiving Casodex 150 mg was 4.9 microgram/ml. The amount of bicalutamide potentially delivered to a female partner during intercourse is low and by extrapolation possibly equates to approximately 0.3 microgram/kg. This is below that required to induce changes in offspring of laboratory animals.

### **Preclinical safety data**

Bicalutamide is a potent antiandrogen and a mixed function oxidase enzyme inducer in animals. Target organ changes, including tumour induction, in animals, are related to these activities. Atrophy of seminiferous tubules of the testes is a predicted class effect with antiandrogens and has been observed for all species examined. Reversal of testicular atrophy occurred 4 months after the completion of dosing in a 6-month rat study (at doses of approximately 1.5 times human therapeutic concentrations at the recommended dose of 50 mg). No recovery was observed at 24 weeks after the completion of dosing in a 12-month rat study (at doses of approximately 2 times human concentrations at the recommended human dose of 50 mg). Following 12-months of repeated dosing in dogs (at doses of approximately 7 times human therapeutic concentrations at the recommended human dose of 50 mg), the incidence of testicular atrophy was the same in dosed and control dogs after a 6 month recovery period. In a fertility study (at doses of approximately 1.5 times human therapeutic concentrations at the recommended human dose of 50 mg), male rats had an increased time to successful mating immediately after 11 weeks of dosing; reversal was observed after 7 weeks off-dose.

### **List of excipients**

Casodex includes the following excipients:  
Lactose Monohydrate

Magnesium Stearate  
Hypromellose  
Macrogol 300  
Povidone  
Sodium Starch Glycolate  
Titanium Dioxide (E171).

**Incompatibilities**

Not applicable.

**Shelf-life**

Please refer to expiry date on the blister strip or outer carton.

**Special precautions for storage**

Do not store above 30°C.

**Instructions for use, handling and disposal**

No special precautions required.

**Pack size**

Please refer to the outer carton for pack size.

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