

## FINASTERIDE- finasteride tablet, film coated

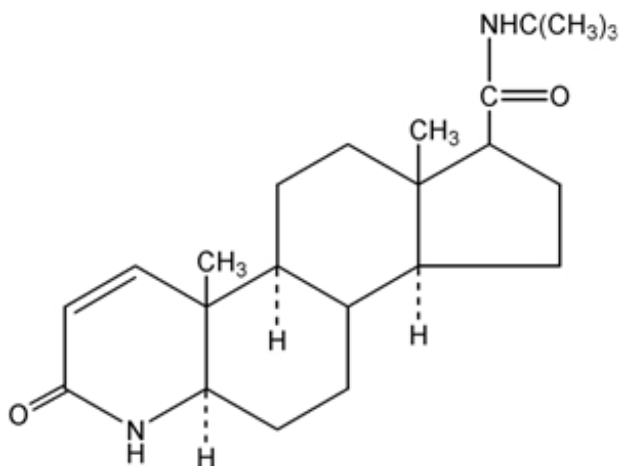
Cardinal Health

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### DESCRIPTION

Finasteride, USP, a synthetic 4-azasteroid compound, is a specific inhibitor of steroid Type II 5 $\alpha$ -reductase, an intracellular enzyme that converts the androgen testosterone into 5 $\alpha$ -dihydrotestosterone (DHT).

Finasteride is 4-Azaandrost-1-ene-17-carboxamide, *N*-(1,1-dimethylethyl)-3-oxo-, (5 $\alpha$ ,17 $\beta$ )-. The molecular formula of finasteride is C<sub>23</sub>H<sub>36</sub>N<sub>2</sub>O<sub>2</sub> and its molecular weight is 372.55. Its structural formula is:



Finasteride is a white to off-white crystalline powder with a melting point near 250°C. It is freely soluble in chloroform and in lower alcohol solvents, but is practically insoluble in water.

Finasteride tablets, USP for oral administration are film-coated tablets that contain 5 mg of finasteride and the following inactive ingredients: anhydrous lactose, colloidal silicon dioxide, croscarmellose sodium, docusate sodium, hypromellose, magnesium stearate, microcrystalline cellulose, polydextrose, polyethylene glycol, povidone, pregelatinized starch, sodium lauryl sulfate, titanium dioxide and triacetin.

### CLINICAL PHARMACOLOGY

The development and enlargement of the prostate gland is dependent on the potent androgen, 5 $\alpha$ -dihydrotestosterone (DHT). Type II 5 $\alpha$ -reductase metabolizes testosterone to DHT in the prostate gland, liver and skin. DHT induces androgenic effects by binding to androgen receptors in the cell nuclei of these organs.

Finasteride is a competitive and specific inhibitor of Type II 5 $\alpha$ -reductase with which it slowly forms a stable enzyme complex. Turnover from this complex is extremely slow ( $t_{1/2}$  ~ 30 days). This has been demonstrated both *in vivo* and *in vitro*. Finasteride has no affinity for the androgen receptor. In man, the 5 $\alpha$ -reduced steroid metabolites in blood and urine are decreased after administration of finasteride.

In man, a single 5 mg oral dose of finasteride produces a rapid reduction in serum DHT concentration, with the maximum effect observed 8 hours after the first dose. The suppression of DHT is maintained throughout the 24 hour dosing interval and with continued treatment. Daily dosing of finasteride at 5 mg/day for up to 4 years has been shown to reduce the serum DHT concentration by approximately

70%. The median circulating level of testosterone increased by approximately 10% to 20% but remained within the physiologic range.

Adult males with genetically inherited Type II 5 $\alpha$ -reductase deficiency also have decreased levels of DHT. Except for the associated urogenital defects present at birth, no other clinical abnormalities related to Type II 5 $\alpha$ -reductase deficiency have been observed in these individuals. These individuals have a small prostate gland throughout life and do not develop BPH.

In patients with BPH treated with finasteride (1 to 100 mg/day) for 7 to 10 days prior to prostatectomy, an approximate 80% lower DHT content was measured in prostatic tissue removed at surgery, compared to placebo; testosterone tissue concentration was increased up to ten times over pretreatment levels, relative to placebo. Intraprostatic content of prostate-specific antigen (PSA) was also decreased.

In healthy male volunteers treated with finasteride for 14 days, discontinuation of therapy resulted in a return of DHT levels to pretreatment levels in approximately 2 weeks. In patients treated for 3 months, prostate volume, which declined by approximately 20%, returned to close to baseline value after approximately 3 months of discontinuation of therapy.

## **Pharmacokinetics**

### **Absorption**

In a study of 15 healthy young subjects, the mean bioavailability of finasteride 5 mg tablets was 63% (range 34% to 108%), based on the ratio of area under the curve (AUC) relative to an intravenous (IV) reference dose. Maximum finasteride plasma concentration averaged 37 ng/mL (range, 27 to 49 ng/mL) and was reached 1 to 2 hours post-dose. Bioavailability of finasteride was not affected by food.

### **Distribution**

Mean steady-state volume of distribution was 76 liters (range, 44 to 96 liters). Approximately 90% of circulating finasteride is bound to plasma proteins. There is a slow accumulation phase for finasteride after multiple dosing. After dosing with 5 mg/day of finasteride for 17 days, plasma concentrations of finasteride were 47% and 54% higher than after the first dose in men 45 to 60 years old (N = 12) and  $\geq$  70 years old (N = 12), respectively. Mean trough concentrations after 17 days of dosing were 6.2 ng/mL (range, 2.4 to 9.8 ng/mL) and 8.1 ng/mL (range, 1.8 to 19.7 ng/mL), respectively, in the two age groups. Although steady-state was not reached in this study, mean trough plasma concentration in another study in patients with BPH (mean age, 65 years) receiving 5 mg/day was 9.4 ng/mL (range, 7.1 to 13.3 ng/mL; N = 22) after over a year of dosing.

Finasteride has been shown to cross the blood brain barrier but does not appear to distribute preferentially to the CSF.

In two studies of healthy subjects (N = 69) receiving finasteride tablets 5 mg/day for 6 to 24 weeks, finasteride concentrations in semen ranged from undetectable ( $<$  0.1 ng/mL) to 10.54 ng/mL. In an earlier study using a less sensitive assay, finasteride concentrations in the semen of 16 subjects receiving finasteride tablets 5 mg/day ranged from undetectable ( $<$  1 ng/mL) to 21 ng/mL. Thus, based on a 5 mL ejaculate volume, the amount of finasteride in semen was estimated to be 50-fold to 100-fold less than the dose of finasteride (5 mcg) that had no effect on circulating DHT levels in men (see also PRECAUTIONS: Pregnancy).

### **Metabolism**

Finasteride is extensively metabolized in the liver, primarily via the cytochrome P450 3A4 enzyme subfamily. Two metabolites, the t-butyl side chain monohydroxylated and monocarboxylic acid metabolites, have been identified that possess no more than 20% of the 5 $\alpha$ -reductase inhibitory activity of finasteride.

### **Excretion**

In healthy young subjects (n = 15), mean plasma clearance of finasteride was 165 mL/min (range, 70 to 279 mL/min) and mean elimination half-life in plasma was 6 hours (range, 3 to 16 hours). Following an oral dose of <sup>14</sup>C-finasteride in man (n = 6), a mean of 39% (range, 32% to 46%) of the dose was excreted in the urine in the form of metabolites; 57% (range, 51% to 64%) was excreted in the feces.

The mean terminal half-life of finasteride in subjects ≥ 70 years of age was approximately 8 hours (range, 6 to 15 hours; n = 12), compared with 6 hours (range, 4 to 12 hours; n = 12) in subjects 45 to 60 years of age. As a result, mean AUC<sub>(0–24 hr)</sub> after 17 days of dosing was 15% higher in subjects ≥ 70 years of age than in subjects 45 to 60 years of age (p = 0.02).

## **Special Populations**

### **Pediatric**

Finasteride pharmacokinetics have not been investigated in patients < 18 years of age.

### **Gender**

Finasteride pharmacokinetics in women are not available.

### **Geriatric**

No dosage adjustment is necessary in the elderly. Although the elimination rate of finasteride is decreased in the elderly, these findings are of no clinical significance. (See also CLINICAL PHARMACOLOGY: Pharmacokinetics: Excretion, PRECAUTIONS: Geriatric Use and DOSAGE AND ADMINISTRATION.)

### **Race**

The effect of race on finasteride pharmacokinetics has not been studied.

### **Renal Insufficiency**

No dosage adjustment is necessary in patients with renal insufficiency. In patients with chronic renal impairment, with creatinine clearances ranging from 9 to 55 mL/min, AUC, maximum plasma concentration, half-life, and protein binding after a single dose of <sup>14</sup>C-finasteride were similar to values obtained in healthy volunteers. Urinary excretion of metabolites was decreased in patients with renal impairment. This decrease was associated with an increase in fecal excretion of metabolites. Plasma concentrations of metabolites were significantly higher in patients with renal impairment (based on a 60% increase in total radioactivity AUC). However, finasteride has been well tolerated in BPH patients with normal renal function receiving up to 80 mg/day for 12 weeks, where exposure of these patients to metabolites would presumably be much greater.

### **Hepatic Insufficiency**

The effect of hepatic insufficiency on finasteride pharmacokinetics has not been studied. Caution should be used in the administration of finasteride in those patients with liver function abnormalities, as finasteride is metabolized extensively in the liver.

### **Drug Interactions**

(see also PRECAUTIONS: Drug Interactions).

No drug interactions of clinical importance have been identified. Finasteride does not appear to affect the cytochrome P450-linked drug metabolism enzyme system. Compounds that have been tested in man have included antipyrine, digoxin, propranolol, theophylline, and warfarin, and no clinically meaningful interactions were found.

## **Mean (SD) Pharmacokinetic Parameters in Healthy Young Subjects (n = 15)**

	<b>Mean (<math>\pm</math> SD)</b>
Bioavailability	63% (34% to 108%)*
Clearance (mL/min)	165 (55)
Volume of Distribution (L)	76 (14)
Half-Life (hours)	6.2 (2.1)

\* Range

### **Mean (SD) Noncompartmental Pharmacokinetic Parameters After Multiple Doses of 5 mg/day in Older Men**

	<b>Mean (<math>\pm</math> SD)</b>	
	<b>45 to 60 years old (n = 12)</b>	<b><math>\geq</math> 70 years old (n = 12)</b>
AUC (ng·hr/mL)	389 (98)	463 (186)
Peak Concentration (ng/mL)	46.2 (8.7)	48.4 (14.7)
Time to Peak (hours)	1.8 (0.7)	1.8 (0.6)
Half-Life (hours)*	6 (1.5)	8.2 (2.5)

\* First-dose values; all other parameters are last-dose values.

### **Clinical Studies**

Finasteride tablet 5 mg/day was initially evaluated in patients with symptoms of BPH and enlarged prostates by digital rectal examination in two 1-year, placebo-controlled, randomized, double-blind studies and their 5-year open extensions.

Finasteride was further evaluated in a long-term efficacy and safety study, a double-blind, randomized, placebo-controlled, 4-year, multicenter study. 3,040 patients between the ages of 45 and 78, with moderate to severe symptoms of BPH and an enlarged prostate upon digital rectal examination, were randomized into the study (1,524 to finasteride, 1,516 to placebo) and 3,016 patients were evaluable for efficacy. 1,883 patients completed the 4-year study (1,000 in the finasteride group, 883 in the placebo group).

### **Effect on Symptom Score**

Symptoms were quantified using a score similar to the American Urological Association Symptom Score, which evaluated both obstructive symptoms (impairment of size and force of stream, sensation of incomplete bladder emptying, delayed or interrupted urination) and irritative symptoms (nocturia, daytime frequency, need to strain or push the flow of urine) by rating on a 0 to 5 scale for six symptoms and a 0 to 4 scale for one symptom, for a total possible score of 34.

Patients in a long-term efficacy and safety study had moderate to severe symptoms at baseline (mean of approximately 15 points on a 0 to 34 point scale). Patients randomized to finasteride who remained on therapy for 4 years had a mean ( $\pm$  1 SD) decrease in symptom score of 3.3 ( $\pm$  5.8) points compared with 1.3 ( $\pm$  5.6) points in the placebo group. (See Figure 1.) A statistically significant improvement in symptom score was evident at one year in patients treated with finasteride vs placebo (-2.3 vs -1.6), and this improvement continued through Year 4.

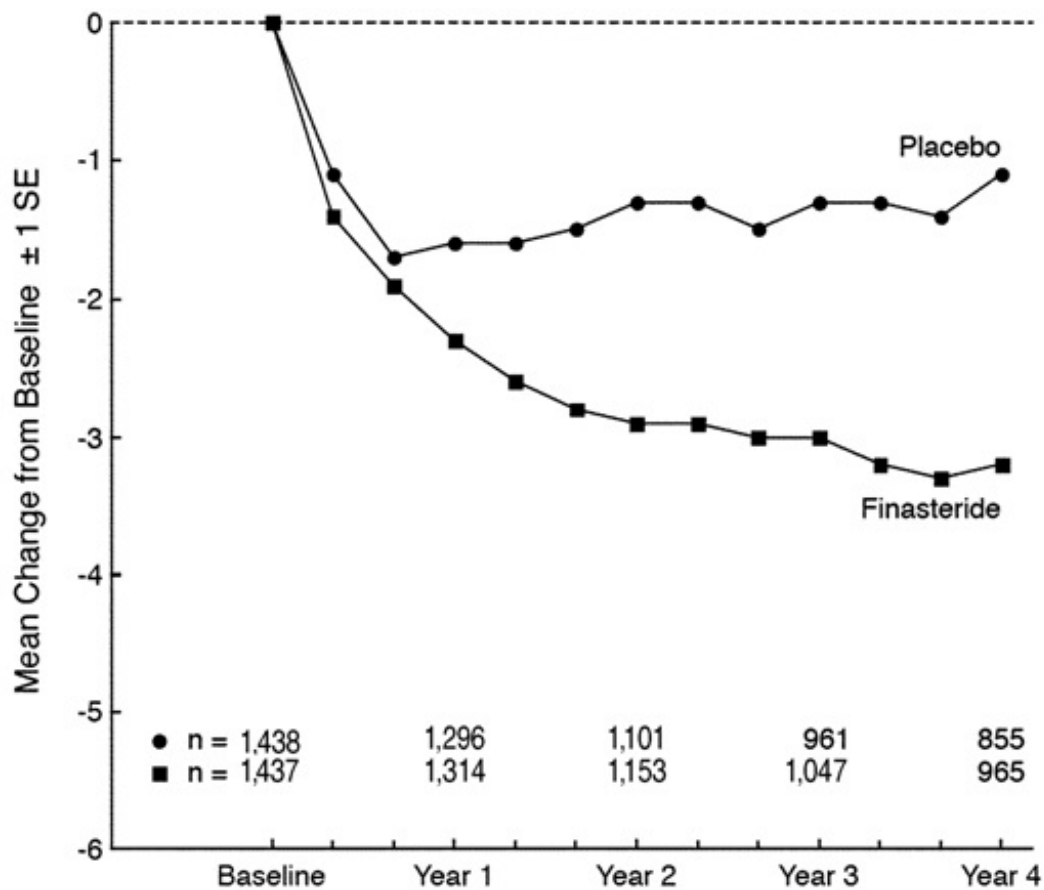


Figure 1 Symptom Score in a Long-Term Efficacy and Safety Study

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Results seen in earlier studies were comparable to those seen in a long-term efficacy and safety study. Although an early improvement in urinary symptoms was seen in some patients, a therapeutic trial of at least 6 months was generally necessary to assess whether a beneficial response in symptom relief had been achieved. The improvement in BPH symptoms was seen during the first year and maintained throughout an additional 5 years of open extension studies.

### Effect on the Need for Surgery

In a long-term efficacy and safety study, efficacy was also assessed by evaluating treatment failures. Treatment failure was prospectively defined as BPH-related urological events or clinical deterioration, lack of improvement and/or the need for alternative therapy. BPH-related urological events were defined as urological surgical intervention. Complete event information was available for 92% of the patients. The following table (Table 1) summarizes the results.

Table 1 All Treatment Failures in a Long-Term Efficacy and Safety Study

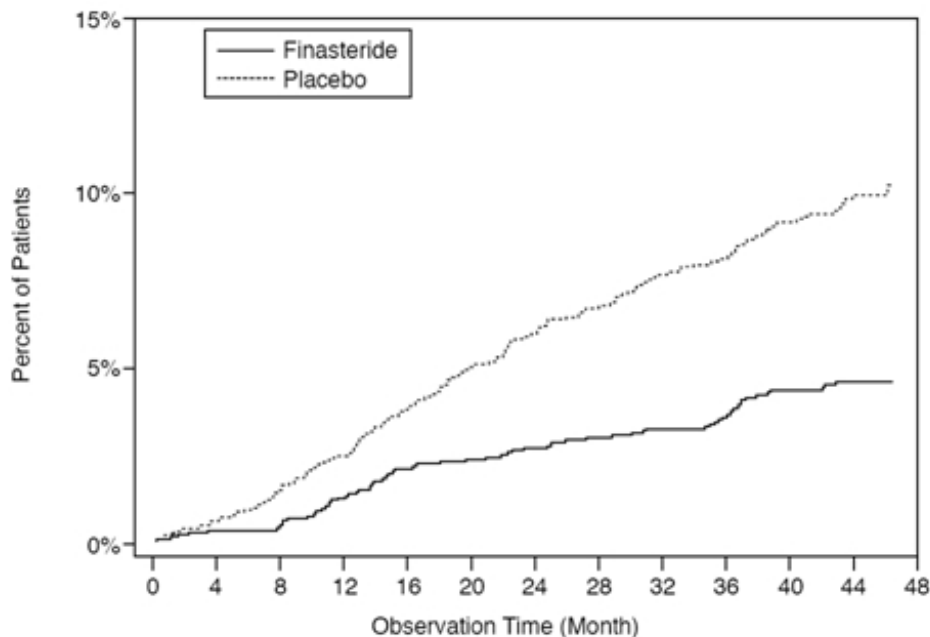
Event	Patients (%) <sup>*</sup>		Relative Risk <sup>†</sup>	95% CI	P Value <sup>†</sup>
	Placebo N = 1,503	Finasteride N = 1,513			
All Treatment Failures	37.1	26.2	0.68	(0.57 to 0.79)	< 0.001
Surgical Interventions for BPH	10.1	4.6	0.45	(0.32 to 0.63)	< 0.001
Two consecutive	0.2	0.7			

symptom scores $\geq 20$	9.2	0.7			
Bladder Stone	0.4	0.5			
Incontinence	2.1	1.7			
Renal Failure	0.5	0.6			
UTI	5.7	4.9			
Discontinuation due to worsening of BPH, lack of improvement, or to receive other medical treatment	21.8	13.3			

\* patients with multiple events may be counted more than once for each type of event

† Hazard ratio based on log rank test

Compared with placebo, finasteride was associated with a significantly lower risk for the need for BPH-related surgery [13.2% for placebo vs 6.6% for finasteride; 51% reduction in risk, 95% CI: (34% to 63%)]. Compared with placebo, finasteride was associated with a significantly lower risk for surgery [10.1% for placebo vs 4.6% for finasteride; 55% reduction in risk, 95% CI: (37% to 68%)]; see Figure 2.



**Figure 2 Percent of Patients Having Surgery for BPH, Including TURP**

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Figure 2 Percent of Patients Having Surgery for BPH, Including TURP

#### Placebo Group

No. of events, cumulative	37	89	121	152
No. at risk, per year	1,503	1,454	1,374	1,314

#### Finasteride Group

No. of events, cumulative	18	40	49	69
No. at risk, per year	1,513	1,483	1,438	1,410

## Effect on Maximum Urinary Flow Rate

In the patients in a long-term efficacy and safety study who remained on therapy for the duration of the study and had evaluable urinary flow data, finasteride increased maximum urinary flow rate by 1.9 mL/sec compared with 0.2 mL/sec in the placebo group.

There was a clear difference between treatment groups in maximum urinary flow rate in favor of finasteride by month 4 (1 vs 0.3 mL/sec) which was maintained throughout the study. In the earlier one year studies, increase in maximum urinary flow rate was comparable to a long-term efficacy and safety study and was maintained through the first year and throughout an additional 5 years of open extension studies.

## Effect on Prostate Volume

In a long-term efficacy and safety study, prostate volume was assessed yearly by magnetic resonance imaging (MRI) in a subset of patients. In patients treated with finasteride who remained on therapy, prostate volume was reduced compared with both baseline and placebo throughout the 4-year study. Finasteride decreased prostate volume by 17.9% (from 55.9 cc at baseline to 45.8 cc at 4 years) compared with an increase of 14.1% (from 51.3 cc to 58.5 cc) in the placebo group ( $p < 0.001$ ). (See Figure 3.)

Results seen in earlier studies were comparable to those seen in a long-term efficacy and safety study. Mean prostate volume at baseline ranged between 40 to 50 cc. The reduction in prostate volume was seen during the first year and maintained throughout an additional 5 years of open extension studies.

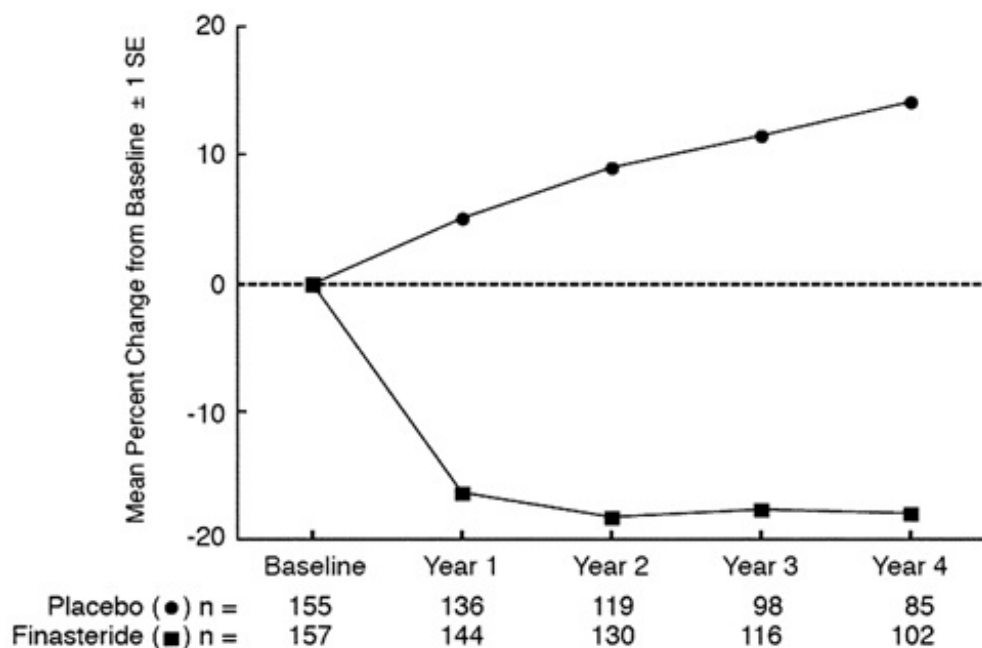


Figure 3 Prostate Volume in a Long-Term Efficacy and Safety Study

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## Prostate Volume as a Predictor of Therapeutic Response

A meta-analysis combining 1-year data from seven double-blind, placebo-controlled studies of similar design, including 4,491 patients with symptomatic BPH, demonstrated that, in patients treated with finasteride, the magnitude of symptom response and degree of improvement in maximum urinary flow

rate were greater in patients with an enlarged prostate at baseline.

## **Summary of Clinical Studies**

The data from these studies, showing improvement in BPH-related symptoms, reduction in treatment failure (BPH-related urological events), increased maximum urinary flow rates, and decreasing prostate volume, suggest that finasteride arrests the disease process of BPH in men with an enlarged prostate.

## **INDICATIONS AND USAGE**

Finasteride tablets are indicated for the treatment of symptomatic benign prostatic hyperplasia (BPH) in men with an enlarged prostate to:

- Improve symptoms
- Reduce the risk of the need for surgery including transurethral resection of the prostate (TURP) and prostatectomy.

## **CONTRAINDICATIONS**

Finasteride tablets are contraindicated in the following:

Hypersensitivity to any component of this medication.

Pregnancy. Finasteride use is contraindicated in women when they are or may potentially be pregnant. Because of the ability of Type II 5 $\alpha$ -reductase inhibitors to inhibit the conversion of testosterone to DHT, finasteride may cause abnormalities of the external genitalia of a male fetus of a pregnant woman who receives finasteride. If this drug is used during pregnancy, or if pregnancy occurs while taking this drug, the pregnant woman should be apprised of the potential hazard to the male fetus. (See also WARNINGS: Exposure of Women – Risk to Male Fetus and PRECAUTIONS: Information for Patients and Pregnancy.) In female rats, low doses of finasteride administered during pregnancy have produced abnormalities of the external genitalia in male offspring.

## **WARNINGS**

Finasteride is not indicated for use in pediatric patients (see PRECAUTIONS: Pediatric Use) or women (see also WARNINGS: Exposure of Women - Risk to Male Fetus; PRECAUTIONS: Information for Patients and Pregnancy; and HOW SUPPLIED).

### **Exposure of Women - Risk to Male Fetus**

Women should not handle crushed or broken finasteride tablets when they are pregnant or may potentially be pregnant because of the possibility of absorption of finasteride and the subsequent potential risk to a male fetus. Finasteride tablets are coated and will prevent contact with the active ingredient during normal handling, provided that the tablets have not been broken or crushed. (See CONTRAINDICATIONS; PRECAUTIONS: Information for Patients and Pregnancy; and HOW SUPPLIED.)

## **PRECAUTIONS**

### **General**

Prior to initiating therapy with finasteride, appropriate evaluation should be performed to identify other conditions such as infection, prostate cancer, stricture disease, hypotonic bladder or other neurogenic disorders that might mimic BPH.

Patients with large residual urinary volume and/or severely diminished urinary flow should be carefully



monitored for obstructive uropathy. These patients may not be candidates for finasteride therapy.

Caution should be used in the administration of finasteride in those patients with liver function abnormalities, as finasteride is metabolized extensively in the liver.

### **Effects on PSA and Prostate Cancer Detection**

No clinical benefit has been demonstrated in patients with prostate cancer treated with finasteride. Patients with BPH and elevated PSA were monitored in controlled clinical studies with serial PSAs and prostate biopsies. In these BPH studies, finasteride did not appear to alter the rate of prostate cancer detection, and the overall incidence of prostate cancer was not significantly different in patients treated with finasteride or placebo.

Finasteride causes a decrease in serum PSA levels by approximately 50% in patients with BPH. This decrease is predictable over the entire range of PSA values, although it may vary in individual patients. Analysis of PSA data from over 3,000 patients in a long-term efficacy and safety study confirmed that in typical patients treated with finasteride for 6 months or more, PSA values should be doubled for comparison with normal ranges in untreated men. This adjustment preserves the sensitivity and specificity of the PSA assay and maintains its ability to detect prostate cancer. Finasteride may also cause decreases in serum PSA in the presence of prostate cancer.

Any confirmed increases in PSA levels from nadir while on finasteride may signal the presence of prostate cancer and should be carefully evaluated, even if those values are still within the normal range for men not taking a 5 $\alpha$ -reductase inhibitor. Non-compliance with finasteride therapy may also affect PSA test results.

Percent free PSA (free to total PSA ratio) is not significantly decreased by finasteride. The ratio of free to total PSA remains constant even under the influence of finasteride. If clinicians elect to use percent free PSA as an aid in the detection of prostate cancer in men undergoing finasteride therapy, no adjustment to its value appears necessary.

### **Information for Patients**

Women should not handle crushed or broken finasteride tablets when they are pregnant or may potentially be pregnant because of the possibility of absorption of finasteride and the subsequent potential risk to the male fetus (see CONTRAINDICATIONS; WARNINGS: Exposure of Women - Risk to Male Fetus; PRECAUTIONS: Pregnancy and HOW SUPPLIED).

Physicians should inform patients that the volume of ejaculate may be decreased in some patients during treatment with finasteride. This decrease does not appear to interfere with normal sexual function. However, impotence and decreased libido may occur in patients treated with finasteride (see ADVERSE REACTIONS).

Physicians should instruct their patients to promptly report any changes in their breasts such as lumps, pain or nipple discharge. Breast changes including breast enlargement, tenderness and neoplasm have been reported (see ADVERSE REACTIONS).

Physicians should instruct their patients to read the patient package insert before starting therapy with finasteride and to reread it each time the prescription is renewed so that they are aware of current information for patients regarding finasteride.

### **Drug/Laboratory Test Interactions**

In patients with BPH, finasteride has no effect on circulating levels of cortisol, estradiol, prolactin, thyroid-stimulating hormone, or thyroxine. No clinically meaningful effect was observed on the plasma lipid profile (i.e., total cholesterol, low density lipoproteins, high density lipoproteins and triglycerides) or bone mineral density. Increases of about 10% were observed in luteinizing hormone (LH) and follicle-stimulating hormone (FSH) in patients receiving finasteride, but levels remained within the normal range. In healthy volunteers, treatment with finasteride did not alter the response of

LH and FSH to gonadotropin-releasing hormone indicating that the hypothalamic-pituitary-testicular axis was not affected.

Treatment with finasteride for 24 weeks to evaluate semen parameters in healthy male volunteers revealed no clinically meaningful effects on sperm concentration, mobility, morphology, or pH. A 0.6 mL (22.1%) median decrease in ejaculate volume with a concomitant reduction in total sperm per ejaculate was observed. These parameters remained within the normal range and were reversible upon discontinuation of therapy with an average time to return to baseline of 84 weeks.

### **Drug Interactions**

No drug interactions of clinical importance have been identified. Finasteride does not appear to affect the cytochrome P450-linked drug metabolizing enzyme system. Compounds that have been tested in man have included antipyrine, digoxin, propranolol, theophylline, and warfarin and no clinically meaningful interactions were found.

### **Other Concomitant Therapy**

Although specific interaction studies were not performed, finasteride was concomitantly used in clinical studies with acetaminophen, acetylsalicylic acid,  $\alpha$ -blockers, angiotensin-converting enzyme (ACE) inhibitors, analgesics, anticonvulsants, beta-adrenergic blocking agents, diuretics, calcium channel blockers, cardiac nitrates, HMG-CoA reductase inhibitors, non-steroidal anti-inflammatory drugs (NSAIDs), benzodiazepines, H<sub>2</sub> antagonists and quinolone anti-infectives without evidence of clinically significant adverse interactions.

### **Carcinogenesis, Mutagenesis, Impairment of Fertility**

No evidence of a tumorigenic effect was observed in a 24-month study in Sprague-Dawley rats receiving doses of finasteride up to 160 mg/kg/day in males and 320 mg/kg/day in females. These doses produced respective systemic exposure in rats of 111 and 274 times those observed in man receiving the recommended human dose of 5 mg/day. All exposure calculations were based on calculated AUC<sub>(0–24 hr)</sub> for animals and mean AUC<sub>(0–24 hr)</sub> for man (0.4 mcg·hr/mL).

In a 19-month carcinogenicity study in CD-1 mice, a statistically significant ( $p \leq 0.05$ ) increase in the incidence of testicular Leydig cell adenomas was observed at a dose of 250 mg/kg/day (228 times the human exposure). In mice at a dose of 25 mg/kg/day (23 times the human exposure, estimated) and in rats at a dose of  $\geq 40$  mg/kg/day (39 times the human exposure) an increase in the incidence of Leydig cell hyperplasia was observed. A positive correlation between the proliferative changes in the Leydig cells and an increase in serum LH levels (2-fold to 3-fold above control) has been demonstrated in both rodent species treated with high doses of finasteride. No drug-related Leydig cell changes were seen in either rats or dogs treated with finasteride for one year at doses of 20 mg/kg/day and 45 mg/kg/day (30 and 350 times, respectively, the human exposure) or in mice treated for 19 months at a dose of 2.5 mg/kg/day (2.3 times the human exposure, estimated).

No evidence of mutagenicity was observed in an *in vitro* bacterial mutagenesis assay, a mammalian cell mutagenesis assay, or in an *in vitro* alkaline elution assay. In an *in vitro* chromosome aberration assay, using Chinese hamster ovary cells, there was a slight increase in chromosome aberrations. These concentrations correspond to 4,000 to 5,000 times the peak plasma levels in man given a total dose of 5 mg. In an *in vivo* chromosome aberration assay in mice, no treatment-related increase in chromosome aberration was observed with finasteride at the maximum tolerated dose of 250 mg/kg/day (228 times the human exposure) as determined in the carcinogenicity studies.

In sexually mature male rabbits treated with finasteride at 80 mg/kg/day (543 times the human exposure) for up to 12 weeks, no effect on fertility, sperm count, or ejaculate volume was seen. In sexually mature male rats treated with 80 mg/kg/day of finasteride (61 times the human exposure), there were no significant effects on fertility after 6 or 12 weeks of treatment; however, when treatment was continued for up to 24 or 30 weeks, there was an apparent decrease in fertility, fecundity and an associated

significant decrease in the weights of the seminal vesicles and prostate. All these effects were reversible within 6 weeks of discontinuation of treatment. No drug-related effect on testes or on mating performance has been seen in rats or rabbits. This decrease in fertility in finasteride-treated rats is secondary to its effect on accessory sex organs (prostate and seminal vesicles) resulting in failure to form a seminal plug. The seminal plug is essential for normal fertility in rats and is not relevant in man.

## **Pregnancy**

### **Teratogenic Effects**

#### ***Pregnancy Category X***

See CONTRAINDICATIONS.

Finasteride is not indicated for use in women.

Administration of finasteride to pregnant rats at doses ranging from 100 mcg/kg/day to 100 mg/kg/day (1 to 1,000 times the recommended human dose of 5 mg/day) resulted in dose dependent development of hypospadias in 3.6% to 100% of male offspring. Pregnant rats produced male offspring with decreased prostatic and seminal vesicular weights, delayed preputial separation and transient nipple development when given finasteride at  $\geq 30$  mcg/kg/day ( $\geq 3/10$  of the recommended human dose of 5 mg/day) and decreased anogenital distance when given finasteride at  $\geq 3$  mcg/kg/day ( $\geq 3/100$  of the recommended human dose of 5 mg/day). The critical period during which these effects can be induced in male rats has been defined to be days 16 to 17 of gestation. The changes described above are expected pharmacological effects of drugs belonging to the class of Type II 5 $\alpha$ -reductase inhibitors and are similar to those reported in male infants with a genetic deficiency of Type II 5 $\alpha$ -reductase. No abnormalities were observed in female offspring exposed to any dose of finasteride *in utero*.

No developmental abnormalities have been observed in first filial generation (F<sub>1</sub>) male or female offspring resulting from mating finasteride-treated male rats (80 mg/kg/day; 61 times the human exposure) with untreated females. Administration of finasteride at 3 mg/kg/day (30 times the recommended human dose of 5 mg/day) during the late gestation and lactation period resulted in slightly decreased fertility in F<sub>1</sub> male offspring. No effects were seen in female offspring. No evidence of malformations has been observed in rabbit fetuses exposed to finasteride *in utero* from days 6 to 18 of gestation at doses up to 100 mg/kg/day (1,000 times the recommended human dose of 5 mg/day). However, effects on male genitalia would not be expected since the rabbits were not exposed during the critical period of genital system development.

The *in utero* effects of finasteride exposure during the period of embryonic and fetal development were evaluated in the rhesus monkey (gestation days 20 to 100), a species more predictive of human development than rats or rabbits. Intravenous administration of finasteride to pregnant monkeys at doses as high as 800 ng/day (at least 60 to 120 times the highest estimated exposure of pregnant women to finasteride from semen of men taking 5 mg/day) resulted in no abnormalities in male fetuses. In confirmation of the relevance of the rhesus model for human fetal development, oral administration of a dose of finasteride (2 mg/kg/day; 20 times the recommended human dose of 5 mg/day or approximately 1 to 2 million times the highest estimated exposure to finasteride from semen of men taking 5 mg/day) to pregnant monkeys resulted in external genital abnormalities in male fetuses. No other abnormalities were observed in male fetuses and no finasteride-related abnormalities were observed in female fetuses at any dose.

### **Nursing Mothers**

Finasteride is not indicated for use in women.

It is not known whether finasteride is excreted in human milk.

### **Pediatric Use**

Finasteride is not indicated for use in pediatric patients.

Safety and effectiveness in pediatric patients have not been established.

### Geriatric Use

Of the total number of subjects included in a long-term efficacy and safety study, 1,480 and 105 subjects were 65 and over and 75 and over, respectively. No overall differences in safety or effectiveness were observed between these subjects and younger subjects, and other reported clinical experience has not identified differences in responses between the elderly and younger patients. No dosage adjustment is necessary in the elderly (see CLINICAL PHARMACOLOGY: Pharmacokinetics and Clinical Studies).

### ADVERSE REACTIONS

Finasteride is generally well tolerated; adverse reactions usually have been mild and transient.

#### 4-Year Placebo-Controlled Study

In a long-term efficacy and safety study, 1,524 patients treated with finasteride and 1,516 patients treated with placebo were evaluated for safety over a period of 4 years. The most frequently reported adverse reactions were related to sexual function. 3.7% (57 patients) treated with finasteride and 2.1% (32 patients) treated with placebo discontinued therapy as a result of adverse reactions related to sexual function, which are the most frequently reported adverse reactions.

Table 2 presents the only clinical adverse reactions considered possibly, probably or definitely drug-related by the investigator, for which the incidence on finasteride was  $\geq 1\%$  and greater than placebo over the 4 years of the study. In years 2 to 4 of the study, there was no significant difference between treatment groups in the incidences of impotence, decreased libido and ejaculation disorder.

**TABLE 2 Drug-Related Adverse Experiences**

	Year 1 (%)		Years 2, 3 and 4* (%)	
	Finasteride	Placebo	Finasteride	Placebo
Impotence	8.1	3.7	5.1	5.1
Decreased Libido	6.4	3.4	2.6	2.6
Decreased Volume of Ejaculate	3.7	0.8	1.5	0.5
Ejaculation Disorder	0.8	0.1	0.2	0.1
Breast Enlargement	0.5	0.1	1.8	1.1
Breast Tenderness	0.4	0.1	0.7	0.3
Rash	0.5	0.2	0.5	0.1

N = 1,524 and 1,516, finasteride vs placebo, respectively

\* Combined Years 2 to 4

#### Phase III Studies and 5-Year Open Extensions

The adverse experience profile in the 1-year, placebo-controlled, Phase III studies, the 5-year open extensions, and a long-term efficacy and safety study were similar.

#### Long-Term Data

There is no evidence of increased adverse experiences with increased duration of treatment with finasteride. New reports of drug-related sexual adverse experiences decreased with duration of therapy.

During the 4-year, placebo-controlled long-term efficacy and safety study that enrolled 3,040 men,

there were two cases of breast cancer in placebo-treated men, but no cases were reported in men treated with finasteride. The relationship between long-term use of finasteride and male breast neoplasia is currently unknown.

In a 7-year placebo-controlled trial that enrolled 18,882 healthy men, 9,060 had prostate needle biopsy data available for analysis. In the finasteride group, 280 (6.4%) men had prostate cancer with Gleason scores of 7 to 10 detected on needle biopsy vs 237 (5.1%) men in the placebo group. Of the total cases of prostate cancer diagnosed in this study, approximately 98% were classified as intracapsular (stage T1 or T2). The clinical significance of these findings is unknown. This information from the literature (Thompson IM, Goodman PJ, Tangen CM, et al. The influence of finasteride on the development of prostate cancer. *N Engl J Med* 2003;349:213–22) is provided for consideration by physicians when finasteride is used as indicated (see INDICATIONS AND USAGE). Finasteride is not approved to reduce the risk of developing prostate cancer.

### **Post-Marketing Experience**

The following additional adverse effects have been reported in post-marketing experience:

- hypersensitivity reactions, including pruritus, urticaria, and swelling of the lips and face
- testicular pain
- male breast cancer.

### **OVERDOSAGE**

Patients have received single doses of finasteride tablets up to 400 mg and multiple doses of finasteride tablets up to 80 mg/day for 3 months without adverse effects. Until further experience is obtained, no specific treatment for an overdose with finasteride can be recommended.

Significant lethality was observed in male and female mice at single oral doses of 1500 mg/m<sup>2</sup> (500 mg/kg) and in female and male rats at single oral doses of 2360 mg/m<sup>2</sup> (400 mg/kg) and 5900 mg/m<sup>2</sup> (1000 mg/kg), respectively.

### **DOSAGE AND ADMINISTRATION**

The recommended dose is 5 mg orally once a day.

Finasteride tablets can be administered alone (see CLINICAL PHARMACOLOGY: Clinical Studies).

Finasteride tablets may be administered with or without meals.

No dosage adjustment is necessary for patients with renal impairment or for the elderly (see CLINICAL PHARMACOLOGY: Pharmacokinetics).

### **HOW SUPPLIED:**

Finasteride Tablets, USP are available containing 5 mg of finasteride, USP.

The 5 mg tablets are white film-coated, round, unscored tablets debossed with **M** on one side of the tablet and **151** on the other side. They are available as follows:

NDC 51079-520-20 – Unit dose blister packages of 100 (10 cards of 10 tablets each).

NDC 51079-520-56 – Unit dose punch cards of 300 (10 punch cards of 30 tablets each).

**Store at 20° to 25°C (68° to 77°F). [See USP Controlled Room Temperature.]  
Protect from light.**

Women should not handle crushed or broken finasteride tablets when they are pregnant or may potentially be pregnant because of the possibility of absorption of finasteride and the subsequent

potential risk to a male fetus (see WARNINGS: Exposure of Women - Risk to Male Fetus, and PRECAUTIONS: Information for Patients and Pregnancy).

**PHARMACIST:** Dispense a Patient Information Leaflet with each prescription.

## **PATIENT INFORMATION ABOUT FINASTERIDE TABLETS, USP**

**Finasteride is for use by men only.**

Please read this leaflet before you start taking finasteride. Also, read it each time you renew your prescription, just in case anything has changed. Remember, this leaflet does not take the place of careful discussions with your doctor. You and your doctor should discuss finasteride when you start taking your medication and at regular checkups.

### **What is finasteride?**

Finasteride is a medication used to treat symptoms of benign prostatic hyperplasia (BPH) in men with an enlarged prostate. Finasteride may be used to reduce the need for surgery related to BPH in men with an enlarged prostate.

### **Who should NOT take finasteride?**

Finasteride is for use by MEN only.

### **Do Not Take finasteride if you are:**

- a woman who is pregnant or may potentially be pregnant. Finasteride may harm your unborn baby. Do not touch or handle crushed or broken finasteride tablets (see “**A warning about finasteride and pregnancy**”).
- allergic to finasteride or any of the ingredients in finasteride. See the end of this leaflet for a complete list of ingredients in finasteride.

### **A warning about finasteride and pregnancy.**

Women who are or may potentially be pregnant must not use finasteride. They should also not handle crushed or broken tablets of finasteride. Finasteride tablets are coated and will prevent contact with the active ingredient during normal handling, provided that the tablets are not broken or crushed.

If a woman who is pregnant with a male baby absorbs the active ingredient in finasteride after oral use or through the skin, it may cause the male baby to be born with abnormalities of the sex organs. If a woman who is pregnant comes into contact with the active ingredient in finasteride, a doctor should be consulted.

### **How should I take finasteride?**

Follow your doctor's instruction.

- Take one tablet by mouth each day. To avoid forgetting to take finasteride, you can take it at the same time every day.
- If you forget to take finasteride, do not take an extra tablet. Just take the next tablet as usual.
- You may take finasteride with or without food.
- Do not share finasteride with anyone else; it was prescribed only for you.

### **What are the possible side effects of finasteride?**

The most common side effects of finasteride include:

- trouble getting or keeping an erection (impotence)
- decrease in sex drive

- decreased volume of ejaculate
- ejaculation disorders
- enlarged or painful breast. You should promptly report to your doctor any changes in your breasts such as lumps, pain or nipple discharge.

In addition, the following have been reported in general use with finasteride:

- allergic reactions, including rash, itching, hives and swelling of the lips and face
- rarely, some men may have testicular pain
- in rare cases, male breast cancer has been reported.

You should discuss side effects with your doctor before taking finasteride and anytime you think you are having a side effect. These are not all the possible side effects with finasteride. For more information, ask your doctor or pharmacist.

**Call your doctor for medical advice about side effects. You may report side effects to FDA at 1-800-FDA-1088.**

### **What you need to know while taking finasteride**

- **You should see your doctor regularly while taking finasteride.** Follow your doctor's advice about when to have these checkups.
- **Checking for prostate cancer.** Your doctor has prescribed finasteride for BPH and not for treatment of prostate cancer — but a man can have BPH and prostate cancer at the same time. Checking for prostate cancer should continue while you take finasteride.
- **About Prostate-Specific Antigen (PSA).** Your doctor may have done a blood test called PSA for the screening of prostate cancer. Because finasteride decreases PSA levels, you should tell your doctor(s) that you are taking finasteride. Changes in PSA levels will need to be carefully evaluated by your doctor(s). Any increase in follow-up PSA levels from their lowest point should be carefully evaluated, even if the test results are still within the normal range. You should also tell your doctor if you have not been taking finasteride as prescribed because this may affect the PSA test results. For more information, talk to your doctor.

### **How should I store finasteride tablets?**

- Store finasteride tablets in a dry place at room temperature.
- Keep finasteride in the original container and keep the container closed.

**Finasteride tablets are coated and will prevent contact with the active ingredient during normal handling, provided that the tablets are not broken or crushed.**

Keep finasteride and all medications out of the reach of children.

Do not give your finasteride tablets to anyone else. It has been prescribed only for you. For more information call Mylan Pharmaceuticals Inc. toll free at 1-877-446-3679 (1-877-4-INFO-RX).

### **What are the ingredients in finasteride tablets, USP?**

**Active ingredients:** finasteride

**Inactive ingredients:** anhydrous lactose, colloidal silicon dioxide, croscarmellose sodium, docusate sodium, hypromellose, magnesium stearate, microcrystalline cellulose, polydextrose, polyethylene glycol, povidone, pregelatinized starch, sodium lauryl sulfate, titanium dioxide and triacetin.

### **What is BPH?**

BPH is an enlargement of the prostate gland. The prostate is located below the bladder. As the prostate enlarges, it may slowly restrict the flow of urine. This can lead to symptoms such as:

- a weak or interrupted urinary stream
- a feeling that you cannot empty your bladder completely
- a feeling of delay or hesitation when you start to urinate
- a need to urinate often, especially at night
- a feeling that you must urinate right away.

In some men, BPH can lead to serious problems, including urinary tract infections, as well as the need for surgery.

**What finasteride does:**

Finasteride lowers levels of a hormone called DHT (dihydrotestosterone), which is a cause of prostate growth. Lowering DHT leads to shrinkage of the enlarged prostate gland in most men. This can lead to gradual improvement in urine flow and symptoms over the next several months. Finasteride will help reduce the need for surgery related to an enlarged prostate. However, since each case of BPH is different, you should know that:

- Even though the prostate shrinks, you may NOT notice an improvement in urine flow or symptoms.
- You may need to take finasteride for six (6) months or more to see whether it improves your symptoms.
- Therapy with finasteride may reduce the need for surgery for an enlarged prostate.

Manufactured by;

**Mylan Pharmaceuticals Inc.**

Morgantown, WV 26505 U.S.A.

Distributed by:

**Mylan Institutional Inc.**

Rockford, IL 61103 U.S.A.

S-12083

3/14

**Package/Label Display Panel**

Finasteride Tablets, USP 5 mg

10 Tablets





NDC 55154-5685-0

**\*H61**

**FINASTERIDE  
TABLETS, USP 5 mg**

**10 TABLETS**

Each film-coated tablet contains:

Finasteride, USP 5 mg

Usual Adult Dosage: 5 mg once a day.

See product insert and Patient Information Leaflet for prescribing information, precautions and warnings.

STORAGE: Store at 20 to 25 C (68 to 77 F). [See USP Controlled Room Temperature.] Protect from light.

**RX ONLY**

WARNING: Finasteride should not be used by women or children. Women who are or may potentially be pregnant must not use finasteride. They should also not handle crushed or broken tablets of finasteride. (See prescribing information.)

WARNING: This package is intended for institutional use only. Keep this and all drugs out of the reach of children. This unit dose package is not child resistant.

Manufactured by:  
Mylan Pharmaceuticals Inc.  
Morgantown, WV 26505 U.S.A.

Packaged and Distributed by:  
Mylan Institutional Inc.  
Rockford, IL 61103 U.S.A  
Mylan.com

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Repackaged by Cardinal Health  
Zanesville, OH 43701  
L41222060414

**LOT #: XXXX**



**EXP. DATE: 12/34**



**FINASTERIDE**

finasteride tablet, film coated

**Product Information**

<b>Product Type</b>	HUMAN PRESCRIPTION DRUG	<b>Item Code (Source)</b>	NDC:55154-5685(NDC:51079-520)
<b>Route of Administration</b>	ORAL		

**Active Ingredient/Active Moiety**

Ingredient Name	Basis of Strength	Strength
FINASTERIDE (UNII: 57GNO57U7G) (FINASTERIDE - UNII:57GNO57U7G)	FINASTERIDE	5 mg

**Inactive Ingredients**

Ingredient Name	Strength
ANHYDROUS LACTOSE (UNII: 3SY5LH9PMK)	
SILICON DIOXIDE (UNII: ETJ7Z6XBU4)	
CROSCARMELOSE SODIUM (UNII: M28OL1HH48)	
DOCUSATE SODIUM (UNII: F05Q2T2JA0)	
HYPROMELLOSES (UNII: 3NXW29V3WO)	
MAGNESIUM STEARATE (UNII: 70097M6I30)	
CELLULOSE, MICROCRYSTALLINE (UNII: OP1R32D61U)	
POLYDEXTROSE (UNII: VH2XOU12IE)	
POLYETHYLENE GLYCOLS (UNII: 3WJQ0SDW1A)	
POVIDONES (UNII: FZ989GH94E)	
STARCH, CORN (UNII: O8232NY3SJ)	
SODIUM LAURYL SULFATE (UNII: 368GB5141J)	
TITANIUM DIOXIDE (UNII: 15FIX9V2JP)	
TRIACETIN (UNII: XHX3C3X673)	

**Product Characteristics**

Color	WHITE	Score	no score
Shape	ROUND	Size	6mm
Flavor		Imprint Code	M;151
Contains			

**Packaging**

#	Item Code	Package Description	Marketing Start Date	Marketing End Date
1	NDC:55154-5685-0	10 in 1 BAG		
1		1 in 1 BLISTER PACK; Type 0: Not a Combination Product		

**Marketing Information**

Marketing Category	Application Number or Monograph Citation	Marketing Start Date	Marketing End Date
ANDA	ANDA077578	07/08/2011	

**Labeler** - Cardinal Health (188557102)**Establishment**

Name	Address	ID/FEI	Business Operations
Cardinal Health		188557102	REPACK(55154-5685)

