

HIGHLIGHTS OF PRESCRIBING INFORMATION

These highlights do not include all the information needed to use DUTASTERIDE AND TAMUSOLIN HYDROCHLORIDE CAPSULES safely and effectively. See full prescribing information for DUTASTERIDE AND TAMUSOLIN HYDROCHLORIDE CAPSULES.

DUTASTERIDE AND TAMUSOLIN HYDROCHLORIDE capsules, for oral use

Initial U.S. Approval: 2010

INDICATIONS AND USAGE

Dutasteride and tamsulosin hydrochloride capsules are a combination of dutasteride, a 5- α -reductase inhibitor, and tamsulosin, an alpha-adrenergic antagonist, indicated for the treatment of symptomatic benign prostatic hyperplasia (BPH) in men with an enlarged prostate. (1.1)

Limitations of Use: Dutasteride-containing products, including dutasteride and tamsulosin hydrochloride capsules, are not approved for the prevention of prostate cancer. (1.2)

DOSAGE AND ADMINISTRATION

- Take one capsule daily approximately 30 minutes after the same meal each day. (2)
- Swallow capsule whole. (2)

DOSAGE FORMS AND STRENGTHS

0.5 mg dutasteride and 0.4 mg tamsulosin hydrochloride. (3)

CONTRAINDICATIONS

- Pregnancy and women of childbearing potential. (4, 5.6, 8.1)
- Pediatric patients. (4)
- Patients with previously demonstrated, clinically significant hypersensitivity (e.g., serious skin reactions, angioedema, urticarial, pruritus, respiratory symptoms) to dutasteride, other 5- α -reductase inhibitors, tamsulosin, or any component of dutasteride and tamsulosin hydrochloride capsules. (4)

WARNINGS AND PRECAUTIONS

- Orthostatic hypotension and/or syncope can occur. Advise patients of symptoms related to postural hypotension and to avoid situations where injury could result if syncope occurs. (5.1)
- Do not use dutasteride and tamsulosin hydrochloride capsules with other alpha-adrenergic antagonists, as this may increase the risk of hypotension. (5.2)
- Dutasteride and tamsulosin hydrochloride capsules reduce serum prostate-specific antigen (PSA) (5.3)

See full prescribing information for details of warnings and precautions.

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FULL PRESCRIBING INFORMATION

1 INDICATIONS AND USAGE

1.1 **Benign Prostatic Hyperplasia (BPH) Treatment**
Dutasteride and tamsulosin hydrochloride capsules are indicated for the treatment of symptomatic BPH in men with an enlarged prostate.

1.2 **Limitations of Use**
Dutasteride-containing products, including dutasteride and tamsulosin hydrochloride capsules, are not approved for the prevention of prostate cancer.

2 DOSAGE AND ADMINISTRATION

The recommended dosage of Dutasteride and Tamsulosin Hydrochloride Capsules is 1 capsule (0.5 mg dutasteride and 0.4 mg tamsulosin hydrochloride) taken once daily approximately 30 minutes after the same meal each day.

The capsules should be swallowed whole and not chewed or opened. Contact with the contents of the dutasteride and tamsulosin hydrochloride capsule may result in irritation of the oropharyngeal mucosa.

3 DOSAGE FORMS AND STRENGTHS

Dutasteride and tamsulosin hydrochloride capsules, containing 0.5 mg dutasteride and 0.4 mg tamsulosin hydrochloride, are capsules with blue opaque cap imprinted with "C280" and white opaque body imprinted with "103.04" in black ink containing white to off-white spherical shaped pellets and one oblong, opaque yellow softgel capsule printed with "C300" in black ink.

4 CONTRAINDICATIONS

- Dutasteride and tamsulosin hydrochloride capsules are contraindicated for use in:
- Pregnancy, in animal reproduction and developmental toxicity studies, dutasteride inhibited development of male fetus external genitalia. Therefore, dutasteride and tamsulosin hydrochloride capsules are contraindicated to a pregnant woman. If dutasteride and tamsulosin hydrochloride capsules are used during pregnancy, or if the patient becomes pregnant while taking dutasteride and tamsulosin hydrochloride capsules, the patient should be apprised of the potential hazard to the fetus (see **Warnings and Precautions (5.6)** for details on risk to a fetus).
 - Women of childbearing potential (see **Warnings and Precautions (8.1)**, **Use in Specific Populations (8.1)**)
 - Pediatric patients (see **Use in Specific Populations (8.4)**)
 - Patients with previously demonstrated, clinically significant hypersensitivity (e.g., serious skin reactions, angioedema, urticaria, pruritus, respiratory symptoms) to dutasteride, other 5- α -reductase inhibitors, tamsulosin, or any other component of dutasteride and tamsulosin hydrochloride capsules. (see **Adverse Reactions (6.2)**).

5 WARNINGS AND PRECAUTIONS

5.1 **Orthostatic Hypotension**
As with other alpha-adrenergic antagonists, orthostatic hypotension (postural hypotension, dizziness, and vertigo) may occur in patients treated with tamsulosin-containing products, including dutasteride and tamsulosin hydrochloride capsules, and can result in syncope. Patients starting treatment with dutasteride and tamsulosin hydrochloride capsules should be cautioned to avoid situations where syncope could result in an injury (see **Adverse Reactions (6.1)**).

5.2 Drug-drug Interactions

Strong Inhibitors of CYP3A4
Tamsulosin-containing products, including dutasteride and tamsulosin hydrochloride capsules, should not be coadministered with strong CYP3A4 inhibitors (e.g., ketoconazole) as this can significantly increase tamsulosin exposure (see **Drug Interactions (7.1)**, **Clinical Pharmacology (12.3)**).

Moderate Inhibitors of CYP3A4, Inhibitors of CYP2D6, or a Combination of Both CYP3A4 and CYP2D6 Inhibitors
Tamsulosin-containing products, including dutasteride and tamsulosin hydrochloride capsules, should be used with caution when coadministered with moderate inhibitors of CYP3A4 (e.g., erythromycin), strong (e.g., paroxetine) or moderate (e.g., terfenadine) inhibitors of CYP2D6, a combination of both CYP3A4 and CYP2D6 inhibitors, or in patients known to be poor metabolizers of CYP2D6, as there is a potential for significant increase in tamsulosin exposure (see **Drug Interactions (7.1)**, **Clinical Pharmacology (12.3)**).

Caution is advised when tamsulosin-containing products, including dutasteride and tamsulosin hydrochloride capsules, are coadministered with cimetidine (see **Drug Interactions (7.1), **Clinical Pharmacology (12.3)**).**

Other Alpha-adrenergic Antagonists
Tamsulosin-containing products, including dutasteride and tamsulosin hydrochloride capsules, may also cause decreases in serum PSA in the presence of prostate cancer. To interpret serial PSA in men treated with a dutasteride-containing product, including dutasteride and tamsulosin hydrochloride capsules, a new baseline PSA should be established at least 3 months after starting treatment and PSA should be periodically thereafter. Any confirmed increase from the lowest PSA value while on a dutasteride-containing treatment, including dutasteride and tamsulosin hydrochloride capsules, may signal the presence of prostate cancer and should be evaluated, even if PSA levels are still within the normal range for men not taking a 5- α -reductase inhibitor. Noncompliance with dutasteride and tamsulosin hydrochloride capsules may also affect PSA test results.

Phosphodiesterase-5 (PDE-5) Inhibitors
Caution is advised when alpha-adrenergic-antagonist-containing products, including dutasteride and tamsulosin hydrochloride capsules, are coadministered with PDE-5 inhibitors. Alpha-adrenergic antagonists and PDE-5 inhibitors are both vasodilators that can lower blood pressure. Concomitant use of these 2 drug classes can potentially cause symptomatic hypotension.

Warfarin
Should be exercised with concomitant administration of warfarin and tamsulosin-containing products, including dutasteride and tamsulosin hydrochloride capsules (see **Drug Interactions (7.2)**, **Clinical Pharmacology (12.3)**).

5.3 **Effects on Prostate-specific Antigen (PSA) and the Use of PSA in Prostate Cancer Detection**
Concomitant administration of tamsulosin resulted in similar changes to serum PSA as with dutasteride monotherapy.

In clinical trials, dutasteride reduced serum PSA concentration by approximately 50% within 3 to 6 months of treatment. This decrease was predictable over the entire range of PSA values in patients with symptomatic BPH, although it may vary in individuals. Dutasteride-containing treatment, including dutasteride and tamsulosin hydrochloride capsules, may also cause decreases in serum PSA in the presence of prostate cancer. To interpret serial PSA in men treated with a dutasteride-containing product, including dutasteride and tamsulosin hydrochloride capsules, a new baseline PSA should be established at least 3 months after starting treatment and PSA should be periodically thereafter. Any confirmed increase from the lowest PSA value while on a dutasteride-containing treatment, including dutasteride and tamsulosin hydrochloride capsules, may signal the presence of prostate cancer and should be evaluated, even if PSA levels are still within the normal range for men not taking a 5- α -reductase inhibitor. Noncompliance with dutasteride and tamsulosin hydrochloride capsules may also affect PSA test results.

To interpret an isolated PSA value in a man treated with dutasteride and tamsulosin hydrochloride capsules, for 3 months or more, the PSA value should be doubled for comparison with normal values in untreated men.

The free-to-total PSA ratio (percent free PSA) remains constant, even under the influence of dutasteride. If clinicians elect to use percent free PSA as an aid in the detection of prostate cancer in men receiving dutasteride and tamsulosin hydrochloride capsules, no adjustment to its value appears necessary.

5.4 Increased Risk of High-grade Prostate Cancer

In men aged 50 to 75 years with a prior negative biopsy for prostate cancer and a baseline PSA between 2.5 ng/mL and 10.0 ng/mL taking dutasteride in the 4-year REDUCE trial, Dutasteride of Prostate Cancer Events (REDUCE) trial, there was an increased incidence of Gleason score 8 to 10 prostate cancer in men taking placebo (dutasteride 1.0% versus placebo 0.5%) (see **Indications and Usage (1.2)**, **Adverse Reactions (6.1)**). In a 7-year placebo-controlled clinical trial with another 5- α -reductase inhibitor (finasteride 5 mg, PROCAR®), similar results for Gleason score 8 to 10 prostate cancer were observed (finasteride 1.8% versus placebo 1.1%).

5- α -reductase inhibitors may increase the risk of development of high-grade prostate cancer. Whether the effect of 5- α -reductase inhibitors to reduce prostate volume or trial-related factors impacted the results of these trials has not been established.

5.5 **Evaluation for Other Urological Diseases**
Prior to initiating treatment with dutasteride and tamsulosin hydrochloride capsules, consideration should be given to other urological conditions that may cause similar symptoms. In addition, BPH and prostate cancer may coexist.

5.6 Exposure of Women-Risk to Male Fetuses

Dutasteride and tamsulosin hydrochloride capsules should not be handled by a woman who is pregnant or who could become pregnant. Dutasteride is absorbed through the skin and could result in fetal harm if a woman who is pregnant or could become pregnant comes in contact with a leaking capsule, the contact area should be washed immediately with soap and water (see **Use in Specific Populations (8.1)**).

5.7 Priapism

Priapism (persistent painful penile erection unrelated to sexual activity) has been associated (probably less than 1 in 50,000) with the use of alpha-adrenergic antagonists, including tamsulosin, which is a component of dutasteride and tamsulosin hydrochloride capsules. Because this condition can lead to permanent impotence if not properly treated, patients should be advised about the seriousness of the condition.

concentration by approximately 50%. However, any confirmed increase in PSA while on dutasteride and tamsulosin hydrochloride capsules may signal the presence of prostate cancer and should be evaluated, even if those values are still within the normal range for untreated men. (5.3)

- Do not use dutasteride and tamsulosin hydrochloride capsules with strong inhibitors of cytochrome P450 (CYP) 3A4 (e.g., ketoconazole). Use caution in combination with moderate CYP3A4 inhibitors (e.g., erythromycin) or strong (e.g., paroxetine) or moderate CYP2D6 inhibitors, a combination of both CYP3A4 and CYP2D6 inhibitors, or known poor metabolizers of CYP2D6. Concomitant use with known inhibitors can cause a marked increase in drug exposure. (5.2, 7.1, 12.3)
- Exercise caution with concomitant use of phosphodiesterase-5 (PDE-5) inhibitors, as this may increase the risk of hypotension. (5.2)
- Drugs that contain dutasteride, including dutasteride and tamsulosin hydrochloride capsules, may increase the risk of high-grade prostate cancer. (5.4, 6.1)
- Prior to initiating treatment with dutasteride and tamsulosin hydrochloride capsules, consideration should be given to other urological conditions that may cause similar symptoms. (5.5)
- Women who are pregnant or who could become pregnant should not handle dutasteride and tamsulosin hydrochloride capsules due to potential risk to male fetus. (5.6, 8.1)
- Advise patients about the possibility and seriousness of priapism. (5.7)
- Patients should not donate blood until 6 months after their last dose of dutasteride and tamsulosin hydrochloride capsules. (5.8)
- Intraoperative Floppy Iris Syndrome has been observed during cataract and glaucoma surgery after alpha-adrenergic antagonist exposure. Advise patients considering cataract or glaucoma surgery to their ophthalmologist that they take or have taken dutasteride and tamsulosin hydrochloride capsules. (5.9)
- Exercise caution with concomitant use of warfarin. (5.2, 7.2, 12.3)

ADVERSE REACTIONS

The most common adverse reactions, reported in ≥1% of subjects treated with coadministered dutasteride and tamsulosin are ejaculation disorders, impotence, decreased libido, dizziness, and breast disorders. (6.1)

To report suspected adverse reactions, contact Par Pharmaceutical at 1-800-828-9393 or FDA at 1-800-FDA-1088 or www.fda.gov/medwatch.

See 17 for PATIENT COUNSELING INFORMATION and FDA- approved patient labeling.

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*Sections or subsections omitted from the full prescribing information are not listed.

8.8 Blood Donation
Men being treated with a dutasteride-containing product, including dutasteride and tamsulosin hydrochloride capsules, should not donate blood until at least 6 months have passed following their last dose. The purpose of this deferral period is to prevent administration of dutasteride to a pregnant female transfusion recipient.

8.9 **Intraoperative Floppy Iris Syndrome**
Intraoperative Floppy Iris Syndrome (IFIS) has been observed during cataract and glaucoma surgery in some patients on or previously treated with alpha-adrenergic-antagonists, including tamsulosin, which is a component of dutasteride and tamsulosin hydrochloride capsules.

Most reports were in patients taking the alpha-adrenergic-antagonist when IFIS occurred, but in some cases, the alpha-adrenergic antagonist had been stopped prior to surgery. In most of these cases, the alpha-adrenergic antagonist should be exercised with concomitant administration of warfarin and tamsulosin-containing surgery (2 to 14 days), but in a few cases, IFIS was reported after the patient had been off the alpha-adrenergic antagonist for a longer period (5 weeks to 9 months). IFIS is a variant of small pupil syndrome and is characterized by the combination of a flaccid iris that billows in response to intraoperative surgical dilation with standard mydriatic drugs, and potential prolapse of the iris toward the phacoemulsification incisions. The patient's ophthalmologist should be prepared for possible modifications to their surgical technique, such as the utilization of iris hooks, iris dilator rings, or viscoelastic substances.

IFIS may increase the risk of eye complications during and after the operation. The benefit of stopping alpha-adrenergic antagonist therapy prior to cataract or glaucoma surgery has not been established. The initiation of therapy with tamsulosin in patients for whom cataract or glaucoma surgery is scheduled is not recommended.

10 Suifa Allergy

In patients with suifa allergy, allergic reaction to tamsulosin has been rarely reported. If a patient reports a serious or life-threatening suifa allergy, caution is warranted when administering tamsulosin-containing products, including dutasteride and tamsulosin hydrochloride capsules.

5.11 **Effect on Semen Characteristics**
Dutasteride
The effects of dutasteride 0.5 mg/day on semen characteristics were evaluated in normal volunteers aged 18 to 52 (n = 27 dutasteride, n = 27 placebo) throughout 52 weeks of treatment and 24 weeks of post-treatment follow-up. At 52 weeks, the mean percent reduction from baseline in total sperm count, semen volume, and sperm motility were 23%, 26%, and 18%, respectively, in the dutasteride group when adjusted for changes from baseline in the placebo group. Sperm concentration and sperm morphology were unaffected. After 24 weeks of follow-up, the mean percent change in total sperm count was 23% lower than baseline. While mean values for all semen parameters at all time-points remained within the normal ranges and did not meet predefined criteria for a clinically significant change (30%), 2 subjects in the dutasteride group had decreases in sperm count or greater than 30% from baseline and tamsulosin hydrochloride capsules. The clinical significance of dutasteride's effect on semen characteristics for an individual patient's fertility is not known.

IFIS may increase the risk of eye complications during and after the operation. The benefit of stopping alpha-adrenergic antagonist therapy prior to cataract or glaucoma surgery has not been established. The initiation of therapy with tamsulosin in patients for whom cataract or glaucoma surgery is scheduled is not recommended.

12.1 Mechanism of Action

Dutasteride is extensively metabolized in humans by the CYP3A4 and CYP3A5 isoenzymes. The effect of potent CYP3A4 inhibitors on dutasteride has not been studied. Because of the potential for drug-drug interactions, use caution when prescribing a dutasteride-containing product, including dutasteride and tamsulosin hydrochloride capsules, to patients taking potent, chronic CYP3A4 enzyme inducers (e.g., rifonavir) (see **Clinical Pharmacology (12.3)**).

Tamsulosin
Strong and Moderate Inhibitors of CYP3A4 or CYP2D6: Tamsulosin is extensively metabolized, mainly by CYP3A4 or CYP2D6. Concomitant treatment with ketoconazole (a strong inhibitor of CYP3A4) resulted in increases in the C_{max} and area under the concentration-time curve (AUC) of tamsulosin by factors of 2.2 and 2.8, respectively. Concomitant treatment with paroxetine (a strong inhibitor of CYP2D6) resulted in increases in the C_{max} and AUC of tamsulosin by factors of 1.3 and 1.6, respectively. A similar increase in exposure is expected in poor metabolizers (PM) of CYP2D6 as compared to extensive metabolizers (EM). Since CYP2D6 PMs cannot be fully identified and the potential for significant increase in tamsulosin exposure is 4 mg is coadministered with strong CYP3A4 inhibitors in CYP2D6 PMs, tamsulosin 0.4 mg capsules should not be used in combination with strong inhibitors of CYP3A4 (e.g., ketoconazole). The effects of coadministration of both a CYP3A4 and a CYP2D6 inhibitor with tamsulosin have not been evaluated. However, there is a potential for significant increase in tamsulosin exposure when tamsulosin 0.4 mg is coadministered with a combination of both CYP3A4 and CYP2D6 inhibitors (see **Warnings and Precautions (5.2)**, **Clinical Pharmacology (12.3)**).

Cimetidine: Treatment with cimetidine resulted in a moderate increase in tamsulosin hydrochloride AUC (44%) (see **Warnings and Precautions (5.2)**, **Clinical Pharmacology (12.3)**).

7.2 Warfarin
Dutasteride
Intradose administration of dutasteride 0.5 mg/day for 3 weeks with warfarin does not alter the steady-state pharmacokinetics of the S- or R-warfarin isomers or alter the effect of warfarin on prothrombin time (see **Clinical Pharmacology (12.3)**).

Tamsulosin
A definitive drug-drug interaction trial between tamsulosin hydrochloride and warfarin was not conducted. Results from limited *in vitro* studies (n = 8) suggest that tamsulosin should be exercised with concomitant administration of warfarin and tamsulosin-containing products, including dutasteride and tamsulosin hydrochloride capsules (see **Warnings and Precautions (5.2)**, **Clinical Pharmacology (12.3)**).

7.1 Nifedipine, Atenolol, Enalapril
Dutasteride
Dose adjustments are not necessary when tamsulosin is administered concomitantly with nifedipine, atenolol, or enalapril (see **Clinical Pharmacology (12.3)**).

7.4 Digoxin and Theophylline
Dutasteride
Dutasteride does not alter the steady-state pharmacokinetics of digoxin when administered concomitantly at a dose of 0.5 mg/day for 3 weeks (see **Clinical Pharmacology (12.3)**).

7.5 Furosemide
Tamsulosin
Dose adjustments are not necessary when tamsulosin is administered concomitantly with digoxin or theophylline (see **Clinical Pharmacology (12.3)**).

7.6 Calcium Channel Antagonists
Dutasteride
Coadministration of verapamil or diltiazem decreases dutasteride clearance and leads to increased exposure to dutasteride. The change in dutasteride exposure is not considered to be clinically significant. No dosage adjustment of dutasteride is recommended (see **Clinical Pharmacology (12.3)**).

7.7 Cholestyramine
Dutasteride: Administration of a single 5 mg dose of dutasteride followed 1 hour later by a 12 g dose of cholestyramine does not affect the relative bioavailability of dutasteride (see **Clinical Pharmacology (12.3)**).

8 USE IN SPECIFIC POPULATIONS

8.1 **Pregnancy**
Pregnancy Category X. There are no adequate and well-controlled studies in pregnant women with dutasteride and tamsulosin hydrochloride capsules or its individual components.

Dutasteride
Dutasteride is contraindicated for use in women of childbearing potential and during pregnancy. Dutasteride is a 5- α -reductase inhibitor that prevents conversion of testosterone to dihydrotestosterone (DHT), a hormone necessary for normal development of male genitalia. In animal reproduction and developmental toxicity studies, dutasteride inhibited normal development of external genitalia in male fetuses. Therefore, dutasteride may cause fetal harm when administered to a pregnant woman. If dutasteride is used during pregnancy or if the patient becomes pregnant while taking dutasteride, the patient should be apprised of the potential hazard to the fetus.

Abnormalities in the genitalia of male fetuses are an expected physiological consequence of inhibition of the conversion of testosterone to DHT by 5- α -reductase inhibitors. These results are similar to observations in male infants with congenital 5- α -reductase deficiency. Dutasteride is absorbed through the skin. To avoid potential reproductive exposure, women who are pregnant or could become pregnant should not handle dutasteride and tamsulosin hydrochloride capsules, including dutasteride and tamsulosin hydrochloride capsules. If contact is made with leaking capsules, the contact area should be washed immediately with soap and water (see **Warnings and Precautions (6.1)). Dutasteride is secreted into semen. The highest measured semen concentration of dutasteride in treated men was 14 ng/mL. Assuming exposure of 10 ng/mL to 1 mL of semen and 100% absorption, the woman's dutasteride exposure would be about 0.01% of the daily recommended dose. This concentration is more than 100 times less than concentrations producing abnormalities of male genitalia in animal studies. Dutasteride is highly protein bound in human semen (greater than 96%), which may reduce the amount of dutasteride available for vaginal absorption.**

In an embryo-fetal development study in female rats, oral administration of dutasteride at doses 10 times less than the maximum recommended human dose (MRHD) of 0.5 mg daily resulted in abnormalities of male genitalia in the fetus (decreased anogenital distance at 0.05 mg/kg/day, nipple development, hypospadias, and distended preputial glands in male offspring (at all doses of 0.05, 2.5, 12.5, and 30 mg/kg/day)). An increase in stillborn pups was observed at 11 times the MRHD, and reduced fetal body weight was observed at doses of 2.0 to 15 times the MRHD (animal dose of 2.5 mg/kg/day). The development of male genitalia was not adversely affected. Histological evaluation of the genitalia of fetuses revealed evidence of feminization of the male fetus at all dose levels. A second embryo-fetal study in rabbits at 0.2 to 15-fold the expected clinical exposure (animal doses of 0.05, 0.4, 3.0, and 30 mg/kg/day) also produced evidence of feminization of the genitalia in male fetuses at all doses.

In an oral pre- and post-natal development study in rats, dutasteride doses of 0.05, 2.5, 12.5, or 30 mg/kg/day were administered. Unequivocal evidence of feminization of the genitalia (i.e., decreased anogenital distance, increased incidence of hypospadias, nipple development, and distended preputial glands) was observed in male offspring of female rats at 0.05-fold greater than the expected clinical exposure (animal dose of 0.05 mg/kg/day), evidence of feminization was limited to a small, but statistically significant, decrease in anogenital distance. Animal doses of 2.5 to 30 mg/kg/day resulted in prolonged gestation in the parental females and a decrease in time to vaginal patency for female offspring and a decrease in prostate weight in male offspring. Effects on newborn starrle response were noted at doses greater than or equal to 12.5 mg/kg/day. Increased stillbirths were noted at 30 mg/kg/day.

In an embryo-fetal development study, pregnant thesus monkeys were exposed intravenously to a dutasteride blood level comparable to the dutasteride concentration found in human semen. Dutasteride was administered on gestation days 20 to 100 (of doses of 400, 780, and 1,560 mg/day (12 monkeys/group)). The development of male genitalia was not adversely affected. Reduction of fetal adrenal weights, reduction in fetal prostate weights, and increases in fetal ovarian and testis weights were observed at the highest dose tested in humans. Based on the highest measured semen concentration of dutasteride in treated men (14 ng/mL), these doses represent 0.8 to 10 times the potential maximum exposure of a male fetus to dutasteride (based on a dutasteride-treated man, assuming 100% absorption). (These calculations are based on blood levels of parent drug which are achieved at 32 to 186 times the daily doses administered to pregnant monkeys on a ng/kg basis). Dutasteride is highly bound to proteins in human semen (greater than 96%), potentially reducing the amount of dutasteride available for vaginal absorption. It is not known whether rabbits or thesus monkeys produce any of the major human metabolites.

Estimates of exposure multiples comparing animal studies to the MRHD for dutasteride are based on clinical serum concentration at steady-state.

Tamsulosin
Administration of tamsulosin to pregnant female rats at dose levels up to approximately 50 times the human therapeutic AUC exposure (animal dose of 300 mg/kg/day) revealed no evidence of harm to the fetus. Administration of tamsulosin hydrochloride to pregnant rabbits at dose levels up to 50 mg/kg/day produced no evidence of fetal harm. However, because of the effect of dutasteride on the fetus, dutasteride and tamsulosin hydrochloride capsules are contraindicated for use in pregnant women. Estimates of exposure multiples comparing animal studies to the MRHD for tamsulosin are based on AUC.

8.2 Nursing Mothers
Dutasteride and tamsulosin hydrochloride capsules are contraindicated for use in women of childbearing potential, including nursing women. It is not known whether dutasteride or tamsulosin is excreted in human milk.

8.4 Pediatric Use
Dutasteride and tamsulosin hydrochloride capsules are contraindicated for use in pediatric patients. Safety and effectiveness of dutasteride and tamsulosin hydrochloride capsules in pediatric patients have not been established.

8.5 Geriatric Use
Of 1,610 male subjects treated with coadministered dutasteride and tamsulosin in the COMBAT trial, 58% of enrolled subjects were aged 65 years and older and 13% of enrolled subjects were aged 75 years and older. No overall differences in safety or efficacy were observed between these subjects and younger subjects but greater sensitivity of some older individuals cannot be ruled out (see **Clinical Pharmacology (12.3)**).

8.6 Renal Impairment
The effect of renal impairment on dutasteride and tamsulosin pharmacokinetics has not been studied using dutasteride and tamsulosin hydrochloride capsules. Because no dosage adjustment is necessary for use in patients with moderate-to-severe renal impairment (10x CL_{CR} <30 mL/min/1.73 m²), no dosage adjustment is necessary for dutasteride and tamsulosin hydrochloride capsules in patients with moderate-to-severe renal impairment. However, patients with end-stage renal disease (CL_{CR} <10 mL/min/1.73 m²) may not have been studied (see **Clinical Pharmacology (12.3)**).

8.7 Hepatic Impairment
The effect of hepatic impairment on dutasteride and tamsulosin pharmacokinetics has not been studied using dutasteride and tamsulosin hydrochloride capsules. The following text reflects information available for the individual components.

Dutasteride
The effect of hepatic impairment on dutasteride pharmacokinetics has not been studied. Because dutasteride is extensively metabolized, exposure could be higher in hepatically impaired patients. However, in a clinical trial where 60 subjects received 5 mg (10 times the therapeutic dose) daily for 24 weeks, no additional adverse events were observed compared with those observed at the therapeutic dose of 0.5 mg (see **Clinical Pharmacology (12.3)**).

Tamsulosin
Patients with moderate hepatic impairment do not require an adjustment in tamsulosin dosage. Tamsulosin has not been studied in patients with severe hepatic impairment (see **Clinical Pharmacology (12.3)**).

No clinical significance of the numerical imbalance in cardiac failure is unknown. No causal relationship between dutasteride alone or coadministered with tamsulosin and cardiac failure has been established. No imbalance was observed in the incidence of overall cardiovascular adverse events in either trial.

Additional information regarding adverse reactions in placebo-controlled trials with dutasteride or tamsulosin monotherapy follows.

Dutasteride
Long-term Treatment (Up to 4 Years): High-grade Prostate Cancer: The REDUCE trial was a randomized, double-blind, placebo-controlled trial that enrolled 8,231 men aged 50 to 75 years with a serum PSA of 2.5 ng/mL, to 10 ng/mL, and a negative prostate biopsy within the previous 6 months. Subjects were randomized to receive placebo (n = 4,126) or 0.5 mg daily doses of dutasteride (n = 4,105) for up to 4 years. The mean age was 63 years and 91% were white. Subjects underwent protocol-mandated scheduled prostate biopsies at 12, 24, 36, and 48 months of treatment or had "non-cause biopsies" at non-scheduled times if clinically indicated. There was a higher incidence of Gleason score 8 to 10 prostate cancer in men receiving dutasteride (1.0%) compared with men on placebo (0.5%) (see **Indications and Usage (1.2)**, **Warnings and Precautions (5.4)**). In a 7-year placebo-controlled clinical trial with another 5- α -reductase inhibitor (finasteride 5 mg, PROCAR®), similar results for Gleason score 8 to 10 prostate cancer were observed (finasteride 1

glaucoma surgery, tell your surgeon if you take or have taken dutasteride and tamsulosin hydrochloride capsules.

• **A painful erection that will not go away.** Rarely, dutasteride and tamsulosin hydrochloride capsules can cause a painful erection (priapism), which cannot be relieved by having sex. If this happens, get medical help right away. If priapism is not treated, there could be lasting damage to your penis, including not being able to have an erection.

The most common side effects of dutasteride and tamsulosin hydrochloride capsules include:

- ejaculation problems*
- trouble getting or keeping an erection (impotence)*
- a decrease in sex drive (libido)*
- dizziness
- enlarged or painful breasts. If you notice breast lumps or nipple discharge, you should talk to your healthcare provider.
- runny nose

* Some of these events may continue after you stop taking dutasteride and tamsulosin hydrochloride capsules.

Depressed mood has been reported in patients receiving dutasteride, an ingredient of dutasteride and tamsulosin hydrochloride capsules.

Dutasteride, an ingredient of dutasteride and tamsulosin hydrochloride capsules, has been shown to reduce sperm count, semen volume, and sperm movement. However, the effect of dutasteride and tamsulosin hydrochloride capsules on male fertility is not known.

Prostate-Specific Antigen (PSA) Test: Your healthcare provider may check you for other prostate problems, including prostate cancer before you start and while you take dutasteride and tamsulosin hydrochloride capsules. A blood test called PSA (prostate-specific antigen) is sometimes used to see if you might have prostate cancer. Dutasteride and tamsulosin hydrochloride capsules will reduce the amount of PSA measured in your blood. Your healthcare provider is aware of this effect and can still use PSA to see if you might have prostate cancer. Increases in your PSA levels while on treatment with dutasteride and tamsulosin hydrochloride capsules (even if the PSA levels are in the normal range) should be evaluated by your healthcare provider.

Tell your healthcare provider if you have any side effect that bothers you or that does not go away.

These are not all the possible side effects with dutasteride and tamsulosin hydrochloride capsules. For more information, ask your healthcare provider or pharmacist.

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

How should I store dutasteride and tamsulosin hydrochloride capsules?

- Store dutasteride and tamsulosin hydrochloride capsules at 20° to 25°C (68° to 77°F) [see USP Controlled Room Temperature].
- Dutasteride and tamsulosin hydrochloride capsules may become deformed and/or discolored if kept at high temperatures.
- Do not use or touch dutasteride and tamsulosin hydrochloride capsules if your capsules are deformed, discolored, or leaking.
- Safely throw away medicine that is no longer needed.

Keep dutasteride and tamsulosin hydrochloride capsules and all medicines out of the reach of children.

Medicines are sometimes prescribed for purposes other than those listed in a patient leaflet. Do not use dutasteride and tamsulosin hydrochloride capsules for a condition for which it was not prescribed. Do not give dutasteride and tamsulosin hydrochloride capsules to other people, even if they have the same symptoms that you have. It may harm them.

This patient information leaflet summarizes the most important information about dutasteride and tamsulosin hydrochloride capsules. If you would like more information, talk with your healthcare provider. You can ask your pharmacist or healthcare provider for information about dutasteride and tamsulosin hydrochloride capsules that is written for health professionals.

What are the ingredients in dutasteride and tamsulosin hydrochloride capsules?

Active ingredients: dutasteride and tamsulosin hydrochloride

Inactive ingredients: butylated hydroxytoluene, ethylcellulose, gelatin, glycerin, lecithin, medium chain triglycerides, methacrylic acid copolymer, mono- and di-glycerides of capryl/capric acid, polyethylene glycol, sugar spheres, talc, triethyl citrate, iron oxide yellow, hypromellose, titanium dioxide, D&C yellow #10, iron oxide black, FD&C blue #2, FD&C blue #1, propylene glycol, FD&C red #40, shellac, polyvinyl acetate phthalate, macrogol, ammonium hydroxide.

How do dutasteride and tamsulosin hydrochloride capsules work? Dutasteride and tamsulosin hydrochloride capsules contain 2 medications, dutasteride and tamsulosin. These 2 medications work in different ways to improve symptoms of BPH. Dutasteride shrinks the enlarged prostate and tamsulosin relaxes muscles in the prostate and neck of the bladder. These 2 medications, when used together, can improve symptoms of BPH better than either medication when used alone.

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Manufactured by:
Par Pharmaceutical
 Chestnut Ridge, NY 10977

R0518 OS280A-01-1-03

Metabolism
 Dutasteride: Dutasteride is extensively metabolized in humans. *In vitro* studies showed that dutasteride is metabolized by the CYP3A4 and CYP3A5 isoenzymes. Both of these isoenzymes produced the 4'-hydroxydutasteride, 6'-hydroxydutasteride, and the 6'-α-dihydroxydutasteride metabolites. In addition, the 15'-hydroxydutasteride metabolite was formed by CYP3A4. Dutasteride is not metabolized *in vivo* by human cytochrome P450 isoenzymes CYP1A2, CYP2A6, CYP2B6, CYP2C8, CYP2C9, CYP2C19, CYP2D6, and CYP2E1. In human serum following dosing to steady state, unchanged dutasteride, 3 major metabolites (4'-hydroxydutasteride, 1,2-dihydroxydutasteride, and 6'-hydroxydutasteride), and 2 minor metabolites (6,4'-dihydroxydutasteride and 15'-hydroxydutasteride), as assessed by mass spectrometric response, have been detected. The absorption of the hydroxy additions in the 6 and 15 positions is not known. *In vivo*, the 4'-hydroxydutasteride and 1,2-dihydroxydutasteride metabolites are much less potent than dutasteride against both isoforms of human 5α-reductase. The activity of 6β-hydroxydutasteride is comparable to that of dutasteride.

Tamsulosin: There is no enantiomeric bioconversion from tamsulosin (R) isomer) to the (S) isomer in humans. Tamsulosin is extensively metabolized by cytochrome P450 enzymes in the liver and less than 10% of the dose is excreted in urine unchanged. However, the pharmacokinetic profile of the metabolites in humans has not been established. *In vitro* studies indicate that CYP3A4 and CYP2D6 are involved in metabolism of tamsulosin as well as some minor participation of other CYP isoenzymes. Inhibition of hepatic drug-metabolizing enzymes may lead to increased exposure to tamsulosin. **Drug Interactions (7.1).** The metabolites of tamsulosin undergo extensive conjugation to glucuronide or sulfate prior to renal excretion.

Incubations with human liver microsomes showed no evidence of clinically significant metabolic interactions between tamsulosin and amitriptyline, albuterol, glyburide, and finasteride. However, results of the *in vitro* testing of the tamsulosin interaction with diclofenac and warfarin were equivocal.

Excretion

Dutasteride: Dutasteride and its metabolites were excreted mainly in feces. As a percent of dose, there was approximately 5% unchanged dutasteride (approximately 1% to approximately 15%) and 40% of dutasteride-related metabolites (approximately 2% to approximately 50%). Only trace amounts of unchanged dutasteride were found in urine (1%). On average, the dose unaccounted for is approximately imated 55% (range: 5% to 57%). The terminal elimination half-life of dutasteride is approximately 5 weeks at steady state. The average steady-state serum dutasteride concentration was 40 ng/mL following 0.5 mg/day for 1 year. Following daily dosing, dutasteride serum concentrations achieve 65% of steady-state concentration after 1 month and approximately 90% after 3 months. Due to the long half-life of dutasteride, serum concentrations remain detectable (greater than 0.1 ng/mL) for up to 4 to 6 months after discontinuation of treatment.

Tamsulosin: On administration of the radiolabeled dose of tamsulosin to 4 healthy volunteers, 97% of the administered radioactivity was recovered, with urine (76%) representing the primary route of excretion compared with feces (21%) over 168 hours.

Following intravenous or oral administration of an immediate-release formulation, the elimination half-life of tamsulosin in plasma ranges from 5 to 7 hours. Because of absorption rate-controlled pharmacokinetics with tamsulosin hydrochloride capsules, the apparent half-life of tamsulosin is approximately 9 to 13 hours in healthy volunteers.

Tamsulosin undergoes restrictive clearance in humans, with a relatively low systemic clearance (2.88 L/h).

Specific Populations

Pediatric: The pharmacokinetics of dutasteride and tamsulosin administered together have not been investigated in subjects younger than 18 years.

Geriatric: Dutasteride and tamsulosin pharmacokinetics using dutasteride and tamsulosin hydrochloride capsules have not been studied in geriatric patients. The following text reflects information for the individual components.

Dutasteride: No dosage adjustment is necessary in the elderly. The pharmacokinetics and pharmacodynamics of dutasteride were evaluated in 36 healthy male subjects aged between 24 and 87 years with normal renal function (CL_{CR} ≥90 mL/min). While receiving a single-dose trial, dutasteride half-life increased with age (approximately 170 hours in men aged 20 to 49 years, approximately 260 hours in men aged 50 to 69 years, and approximately 300 hours in men older than 70 years).

Tamsulosin: Cross-study comparison of tamsulosin overall exposure (AUC) and half-life indicate that the pharmacokinetic disposition of tamsulosin may be slightly prolonged in geriatric males compared with young, healthy male volunteers. Intrinsic clearance is independent of tamsulosin binding to AAG, but diminishes with age, resulting in a 40% overall higher exposure (AUC) in subjects aged 55 to 75 years compared with subjects aged 20 to 32 years.

Gender:

Dutasteride: Dutasteride is contraindicated in pregnancy and women of childbearing potential and is not indicated for use in other women [see **CONTRAINDICATIONS (4), Warnings and Precautions (5.6)**]. The pharmacokinetics of dutasteride in women have not been studied.

Tamsulosin: Tamsulosin is not indicated for use in women. No information is available on the pharmacokinetics of tamsulosin in women.

Race: The effect of race on pharmacokinetics of dutasteride and tamsulosin administered together or separately has not been studied.

Renal Impairment: The effect of renal impairment on dutasteride and tamsulosin pharmacokinetics has not been studied using dutasteride and tamsulosin hydrochloride capsules. The following text reflects information for the individual components.

Dutasteride: The effect of renal impairment on dutasteride pharmacokinetics has not been studied. However, less than 0.1% of a steady-state 0.5 mg dose of dutasteride is recovered in human urine, so no adjustment in dosage is anticipated for patients with renal impairment.

Tamsulosin: The pharmacokinetics of tamsulosin have been compared in 6 subjects with mild-moderate (30s CL_{CR} <70 mL/min) 73 m²) or moderate-severe (15s CL_{CR} <30 mL/min/1.73 m²) renal impairment and 6 normal subjects (CL_{CR} ≥90 mL/min/1.73 m²). While receiving the overall plasma concentration of tamsulosin was observed as the result of altered binding to AAG, the unbound (active) concentration of tamsulosin, as well as the intrinsic clearance, remained relatively constant. Therefore, patients with renal impairment do not require an adjustment in tamsulosin dosing. However, patients with end-stage renal disease (CL_{CR} <10 mL/min/1.73 m²) have not been studied.

Hepatic Impairment: The effect of hepatic impairment on dutasteride and tamsulosin pharmacokinetics has not been studied using dutasteride and tamsulosin hydrochloride capsules. The following text reflects information available for the individual components.

Dutasteride: The effect of hepatic impairment on dutasteride pharmacokinetics has not been studied. Because dutasteride is extensively metabolized, exposure could be higher in hepatically impaired patients.

Tamsulosin: The pharmacokinetics of tamsulosin have been compared in 8 subjects with moderate hepatic impairment (Child-Pugh classification: Grades A and B) and 8 normal subjects. While a change in the overall plasma concentration of tamsulosin was observed as the result of altered binding to AAG, the unbound (active) concentration of tamsulosin did not differ significantly from that of the normal subjects in intrinsic clearance of unbound tamsulosin. Therefore, patients with moderate hepatic impairment do not require an adjustment in tamsulosin dosage. Tamsulosin has not been studied in patients with severe hepatic impairment.

Drug Interactions

There have been no drug interaction studies using dutasteride and tamsulosin hydrochloride capsules. The following text reflects information available for the individual components.

Cytochrome P450 Inhibitors: Dutasteride: No clinical drug interaction trials have been performed to evaluate the impact of CYP3A enzyme inhibitors on dutasteride pharmacokinetics. However, based on *in vitro* data, blood concentrations of dutasteride may increase in the presence of inhibitors of CYP3A4/5 such as ritonavir, ketoconazole, verapamil, diltiazem, cimetidine, trioleandrin, and ciprofloxacin. Dutasteride does not inhibit the *in vitro* metabolism of model substrates for the major human cytochrome P450 isoenzymes (CYP1A2, CYP2C8, CYP2C19, CYP2D6, and CYP3A4) at a concentration of 1,000 ng/mL, 25 times greater than steady-state serum concentrations in humans.

Tamsulosin: Strong and Moderate Inhibitors of CYP3A4 or CYP2D6: The effects of ketoconazole (a strong inhibitor of CYP3A4) at 400 mg once daily for 5 days on the pharmacokinetics of a single tamsulosin hydrochloride capsule 0.4 mg dose was investigated in 24 healthy volunteers (age range: 21 to 47 years). The effects of diltiazem (a moderate inhibitor of CYP3A4) at 60 mg once daily for 5 days on the pharmacokinetics of tamsulosin were also investigated in 24 healthy volunteers by factors of 2.2 and 2.8, respectively. The effects of concomitant administration of a moderate CYP3A4 inhibitor (e.g., erythromycin) on the pharmacokinetics of tamsulosin have not been evaluated.

The effects of paroxetine (a strong inhibitor of CYP2D6) at 20 mg once daily for 9 days on the pharmacokinetics of a single tamsulosin hydrochloride 0.4 mg dose was investigated in 24 healthy volunteers (age range: 21 to 47 years). The mean increases in C_{max} and AUC of tamsulosin by factors of 1.3 and 1.6, respectively. A similar increase in exposure is expected in poor metabolizers (PM) of CYP2D6 as compared with extensive metabolizers (EM). A fraction of the population (about 7% of whites and 2% of African-Americans) are CYP2D6 PMs. Since CYP2D6 PMs do not metabolize paroxetine, the effects of paroxetine on tamsulosin exposure exist when tamsulosin 0.4 mg is coadministered with strong CYP3A4 inhibitors in CYP2D6 PMs, tamsulosin 0.4 mg capsules should not be used in combination with strong inhibitors of CYP3A4 (e.g., ketoconazole).

The effects of concomitant administration of a moderate CYP2D6 inhibitor (e.g., terbinafine) on the pharmacokinetics of tamsulosin have not been evaluated.

The effects of coadministration of both a CYP3A4 and a CYP2D6 inhibitor with tamsulosin capsules have not been evaluated. However, there is a potential for significant increase in tamsulosin exposure when tamsulosin 0.4 mg is coadministered with a combination of both CYP3A4 and CYP2D6 inhibitors.

Cimetidine: The effects of cimetidine at the highest recommended dose (400 mg every 6 hours for 6 days) on the pharmacokinetics of a single tamsulosin capsule 0.4 mg dose was investigated in 10 healthy volunteers (age range: 21 to 38 years). Treatment with cimetidine resulted in a significant decrease (26%) in the clearance of tamsulosin hydrochloride, which resulted in a moderate increase in tamsulosin hydrochloride AUC (44%).

Alpha-adrenergic Antagonists: Dutasteride: In a single-sequence, crossover trial in healthy volunteers, the administration of tamsulosin or terazosin in combination with dutasteride had no effect on the steady-state pharmacokinetics of either alpha-adrenergic antagonist. Although the effect of administration of tamsulosin on plasma levels of dutasteride was not evaluated, the percent change in DHT concentrations was similar for dutasteride, alone or in combination with tamsulosin or terazosin.

Warfarin:

Dutasteride: In a trial of 23 healthy volunteers, 3 weeks of treatment with dutasteride 0.5 mg/day did not alter the steady-state pharmacokinetics of the S- or R-warfarin isomers or alter the effect of warfarin on prothrombin time when administered with warfarin.

Tamsulosin: A definitive drug-drug interaction trial between tamsulosin and warfarin was not conducted. Results from limited *in vitro* and *in vivo* studies are inconclusive. Therefore, caution should be exercised with concomitant administration of warfarin and tamsulosin.

Nifedipine, Atenolol, Enalapril:

Dutasteride: In 3 trials in hypertensive subjects (age range: 47 to 79 years) whose blood pressure was controlled with stable doses of nifedipine extended-release, atenolol, or enalapril for at least 3 months, tamsulosin hydrochloride capsules 0.4 mg for 7 days followed by tamsulosin hydrochloride capsules 0.8 mg for another 7 days (n = 4 per trial) resulted in no clinically significant effects on blood pressure and pulse rate compared with placebo (n = 4 per trial). Therefore, dosage adjustments are not necessary when tamsulosin is administered concomitantly with nifedipine extended-release, atenolol, or enalapril.

Digoxin and Theophylline:
 Dutasteride: In a trial of 20 healthy volunteers, dutasteride did not alter the steady-state pharmacokinetics of digoxin when administered concomitantly at a dose of 0.5 mg/day for 3 weeks.

Tamsulosin: In 2 trials in healthy volunteers (n = 10 per trial; age range: 19 to 39 years) receiving tamsulosin capsules 0.4 mg/day for 2 days, followed by tamsulosin capsules 0.8 mg/day for 5 to 8 days, single intravenous doses of digoxin 0.5 mg or theophylline 5 mg/kg resulted in no change in the pharmacokinetics of digoxin or theophylline. Therefore, dosage adjustments are not necessary when a tamsulosin capsule is administered concomitantly with digoxin or theophylline.

Furosemide:

Tamsulosin: The pharmacokinetic and pharmacodynamic interaction between tamsulosin hydrochloride capsules 0.8 mg (steady-state) and furosemide 20 mg intravenously (single dose) was evaluated in 10 healthy volunteers (age range: 21 to 40 years). Tamsulosin had no effect on the pharmacodynamics (excretion of electrolytes) of furosemide. While furosemide produced an 11% to 12% reduction in tamsulosin C_{max} and AUC, these changes are expected to be clinically insignificant and do not require dose adjustment for tamsulosin.

Calcium Channel Antagonists:

Dutasteride: In a population pharmacokinetics analysis, a decrease in clearance of dutasteride was noted when coadministered with the CYP3A4 inhibitors verapamil (37%, n = 6) and diltiazem (44%, n = 5). In contrast, no decrease in clearance was seen when amitriptyne, another calcium channel antagonist that is not a CYP3A4 inhibitor, was coadministered with dutasteride (17%, n = 4). The decrease in clearance and subsequent increase in exposure to dutasteride in the presence of verapamil and diltiazem is not considered to be clinically significant. No dosage adjustment is recommended.

Cyclosporin:

Dutasteride: Administration of a single 5 mg dose of dutasteride followed 1 hour later by 12 g cyclosporin did not affect the relative bioavailability of dutasteride in 12 normal volunteers.

13 NONCLINICAL TOXICOLOGY

13.1 Carcinogenesis, Mutagenesis, Impairment of Fertility

No non-clinical studies have been conducted with dutasteride and tamsulosin hydrochloride capsules. The following information is based on studies performed with dutasteride or tamsulosin.

Carcinogenesis

Dutasteride: A 2-year carcinogenicity study was conducted in B6C3F1 mice at doses of 3, 35, 250, and 500 mg/kg/day for males and 3, 35, and 250 mg/kg/day for females; an increased incidence of benign hepatocellular adenomas was noted at 250 mg/kg/day (290-fold the MRHD of 0.5 mg daily dose) in male mice only. Two of the 3 major human metabolites have been detected in mice. The exposure to these metabolites in mice is either lower than in humans or is not known.

In a 2-year carcinogenicity study in Han Wistar rats, at doses of 1.5, 7.5, and 53 mg/kg/day in males and 0.8, 6.3, and 15 mg/kg/day in females, there was an increase in Leydig cell adenomas in the testes at 135-fold the MRHD (53 mg/kg/day and greater). An increased incidence of Leydig cell hyperplasia was present at 52-fold the MRHD (male rat doses of 7.5 mg/kg/day and greater). A positive correlation between proliferative changes in the Leydig cells and an increase in circulating luteinizing hormone levels has been demonstrated with 5-alpha-reductase inhibitors and is consistent with an effect on the hypothalamic-pituitary-testicular axis following 5-alpha-reductase inhibition. At tumorigenic doses, luteinizing hormone levels in rats were increased by 167%. In this study, the major human metabolites were tested for carcinogenicity at approximately 1 to 3 times the expected clinical exposure.

Tamsulosin: In a rat carcinogenicity assay, no increases in tumor incidence was observed in rats administered up to 3 times the MRHD of 0.8 mg/day (based on AUC of animal doses up to 43 mg/kg/day in males and up to 52 mg/kg/day in females), with the exception of a modest increase in the frequency of mammary gland fibroadenomas in female rats receiving doses of 5.4 mg/kg or greater.

In a carcinogenicity assay, mice were administered up to 8 times the MRHD of tamsulosin (oral doses up to 127 mg/kg/day in males and 158 mg/kg/day in females). There were no significant tumor findings in male mice. Female mice treated for 2 years with the 2 highest doses of 45 and 158 mg/kg/day had statistically significant increases in the incidence of mammary gland fibroadenomas (P<0.0001) and adenocarcinomas.

The increased incidences of mammary gland neoplasms in female rats and mice were considered secondary to tamsulosin-induced hyperproliferation. It is not known if tamsulosin elevates prolactin in humans. The relevance for human risk of the findings of prolactin-mediated endocrine tumors in rodents is not known.

Mutagenesis

Dutasteride: Dutasteride was tested for genotoxicity in a bacterial mutagenicity assay (Ames test), a chromosomal aberration assay in

Chinese hamster ovary (CHO) cells, and a micronucleus assay in rats. The results did not indicate any genotoxic potential of the parent drug. Two major human metabolites were also negative in either the Ames test or an abbreviated Ames test.

Tamsulosin: Tamsulosin produced no evidence of mutagenic potential *in vitro* in the Ames reverse mutation test, mouse lymphoma thymidine kinase assay, unscheduled DNA repair synthesis assay, and chromosomal aberration assays in CHO cells or human lymphocytes. There were no mutagenic effects in the *in vivo* sister chromatid exchange and mouse micronucleus assay.

Impairment of Fertility

Dutasteride: Treatment of sexually mature male rats with dutasteride at 0.1- to 110-fold the MRHD (animal doses of 0.5, 10, 50, and 500 mg/kg/day for up to 3 weeks) resulted in dose- and time-dependent decreases in fertility; reduced cauda epididymal (absolute) sperm counts but not sperm concentration (at 50 and 500 mg/kg/day); reduced weights of the epididymis, prostate, and seminal vesicles; and endoscopic changes in the reproductive tract of the reproductive organs. The fertility effects were reversed by recovery week 6 at all doses, and sperm counts were normal at the end of 14-week recovery period. The 5-alpha-reductase-related changes consisted of cytoplasmic vacuolation of tubular epithelium in the epididymides and decreased cytoplasmic content of epithelium, consistent with decreased secretory activity in the accessory sex glands. The effects were not observed in the low-dose group and were partly reversed in the remaining treatment groups. Low levels of dutasteride (0.6 to 1.7 ng/mL) were detected in the serum of untreated female rats mated to males dosed at 10, 50, or 500 mg/kg/day for 29 to 30 weeks.

In a fertility study in female rats, oral administration of dutasteride at doses of 0.05, 2.5, 12.5, and 30 mg/kg/day resulted in reduced litter size, reduced embryo resorption and feminization of male fetuses (decreased anogenital distance) at 2- to 10-fold the MRHD (animal doses of 2.5 mg/kg/day or greater). Fetal body weights were also reduced at less than 0.2-fold the MRHD in rats (0.5 mg/kg/day).

Tamsulosin: Studies in rats revealed significantly reduced fertility in males at approximately 50 times the MRHD based on AUC (single or multiple daily doses of 300 mg/kg/day tamsulosin hydrochloride). The mechanism of decreased fertility in male rats is considered to be an effect of the compound on the vaginal plug formation possibly due to changes of semen content or impairment of ejaculation. The effects on fertility were reversible showing improvement by 3 days after a single dose and 4 weeks after multiple dosing. Effects on fertility in males were completely reversed within nine weeks of discontinuation of multiple dosing. Multiple doses of 0.2 and 16 times the MRHD (animal doses of 10 and 100 mg/kg/day tamsulosin hydrochloride) did not significantly alter fertility in male rats. Effects of tamsulosin on sperm counts or sperm function have not been evaluated.

Studies in female rats revealed significant reductions in fertility after single or multiple dosing with 300 mg/kg/day of the R-isomer or racemic mixture of tamsulosin hydrochloride, respectively. In female rats, the reductions in fertility after single doses were considered to be associated with impairments in fertilization. Multiple dosing with 10 to 100 mg/kg/day of the racemic mixture did not significantly alter fertility in female rats.

Estimates of exposure multiples comparing animal studies with the MRHD for dutasteride are based on clinical serum concentration at steady-state.

Estimates of exposure multiples comparing animal studies with the MRHD for tamsulosin are based on AUC.

13.2 Animal Toxicology and/or Pharmacology

Central Nervous System Toxicology Studies

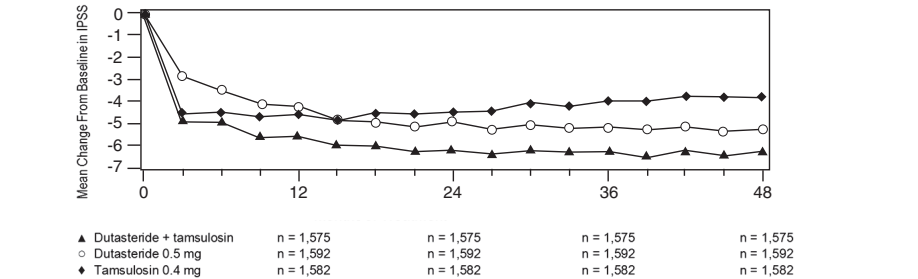
Dutasteride: In rats and dogs, repeated oral administration of dutasteride resulted in some animals showing signs of non-specific, reversible, centrally-mediated toxicity associated with histopathological changes at exposures 425- and 315-fold the expected clinical exposure (of parent drug), respectively.

14 CLINICAL STUDIES

The trial supporting the efficacy of dutasteride and tamsulosin hydrochloride capsules was a 4-year multicenter, randomized, double-blind, parallel-group trial (CombAT trial) investigating the efficacy of the coadministration of dutasteride 0.5 mg/day and tamsulosin hydrochloride 0.4 mg/day (n = 1,810) compared with dutasteride alone (n = 1,820) or tamsulosin alone (n = 1,811). Subjects were at least 50 years of age with a serum PSA of 1.5 mg/mL and <10 mg/mL, and BPH diagnosed by medical history and physical examination including enlarged prostate (≥30 cc) and BPH symptoms that were moderate to severe according to the International Prostate Symptom Score (IPSS). Eighty-eight percent (88%) of the enrolled trial population was white. Approximately 52% of subjects had previous exposure to 5-alpha-reductase inhibitor or alpha-adrenergic antagonist treatment. Of the 5,844 subjects randomly assigned to receive treatment, 69% of subjects in the coadministration group, 67% in the dutasteride group, and 61% in the tamsulosin group completed 4 years of double-blind treatment.

Effect on Symptom Score
 Symptoms were quantified using the first 7 questions of the International Prostate Symptom Score (IPSS). The baseline score was approximately 16.4 units for each treatment group. Coadministration therapy was statistically superior to each of the monotherapy treatments in decreasing symptom score at Month 24, the primary time point for this endpoint. At Month 24, the mean changes from baseline (sSD) in IPSS total symptom scores were -6.2 (±7.14) for the coadministration group, -4.9 (±6.81) for dutasteride, and -4.3 (±7.01) for tamsulosin, with a mean difference between coadministration and dutasteride of -1.3 units (P<0.001; [95% CI: -1.69, -0.86]), and between coadministration and tamsulosin of -1.8 units (P<0.001; [95% CI: -2.23, -1.40]). A significant difference was seen by Month 9 and continued through Month 48. At Month 48, the mean changes from baseline (sSD) in IPSS total symptom scores were -6.3 (±7.40) for coadministration, -5.3 (±7.14) for dutasteride, and -3.8 (±7.74) for tamsulosin, with a mean difference between coadministration and dutasteride of -0.96 units (P<0.001; [95% CI: -1.40, -0.52]), and between coadministration and tamsulosin of -2.5 units (P<0.001; [95% CI: -2.96, -2.07]). See Figure 1.

Figure 1. International Prostate Symptom Score Change from Baseline over a 48-Month Period (Randomized, Double-blind, Parallel-group Trial [CombAT Trial])



Effect on Acute Urinary Retention or the Need for BPH-Related Surgery
 After 4 years of treatment, coadministration therapy with dutasteride and tamsulosin did not provide benefit over dutasteride monotherapy in reducing the incidence of AUR or BPH-related surgery.

In separately 2-year randomized, double-blind trials, compared with placebo, dutasteride monotherapy was associated with a statistically significantly lower incidence of AUR (1.1% for placebo, 57% reduction in risk) for dutasteride versus 4.2% for placebo; 48% reduction in risk) and with a statistically significantly lower incidence of BPH-related surgery (2.2% for dutasteride versus 4.1% for placebo; 48% reduction in risk).

Effect on Maximum Urethral Flow Rate

The baseline Q_{max} was approximately 10.7 mL/sec for each treatment group. Coadministration therapy was statistically superior to each of the monotherapy treatments in increasing Q_{max} at Month 24, the primary time point for this endpoint. At Month 24, the mean increases from baseline (sSD) in Q_{max} were 1.24 (±5.26) mL/sec for coadministration group, 1.6 (±5.10) mL/sec for dutasteride, and 0.9 (±4.57) mL/sec for tamsulosin, with a mean difference between coadministration and dutasteride of 0.5 mL/sec (P = 0.003; [95% CI: 0.17, 0.84]).

At Month 48, the mean increases from baseline (sSD) in Q_{max} were 1.1% (P = NS) [95% CI: 0.6, 2.6]) for coadministration, 0.8% (P = NS) [95% CI: -0.4, 1.98]) for dutasteride, and 0.7% (P = NS) [95% CI: -0.4, 1.98]) for tamsulosin. This difference was seen by Month 6 and continued through Month 24. See Figure 2.

The additional