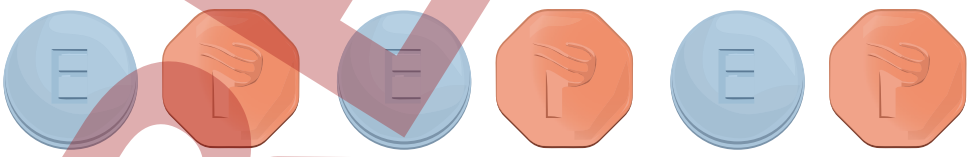
FINASTERIDE

GENERIC NAME: Finasteride

COMMON BRAND NAMES: Propecia, Proscar

DRUG FAMILY: 5α-reductase inhibitor

PRICE RANGE: ($10 Generic | $60-140 per month Branded)*Approximate



History & Background

P. Roy Vagelos, an American physician and business executive, who was president of the American pharmaceutical company Merck & Co, initially developed Finasteride in 1975.

His inspiration for creating this drug was a report he read which was written by Dr.Julianne Imperato-McGinley, an endocrinologist at Cornell Medical College. Dr. Imperato reported a condition suffered by children from a small village in the Dominican Republic. These

children appeared sexually ambiguous at birth and were initially raised as girls. Yet, after puberty, they grew external male genitalia and other masculine characteristics.

The research discovered that these children shared a genetic mutation. The mutation caused a deficiency of an enzyme which transforms testosterone into dihydrotestosterone (DHT). DHT is of course a more potent form of testosterone which drive puberty in young boys and prostatic tissue growth in older men. The name of the affected enzyme was 5-αlpha reductase. The low levels of DHT caused these kids to lack sexual characteristics, such as external testicles and a penis.
At puberty, the natural increase in testosterone levels allowed the sexual differentiation, but there were some differences for normal individuals. One of them was an affected prostate, which was much smaller than normal and under-developed. Later on in life they also seemed to lack incidence of male pattern baldness.

Based on this investigation, Merck & Co wanted to create a drug that could produce the same metabolic effect of the 5 αlpha reductase deficit. They wanted a drug that would produce the same prostate shrinking and baldness preventing effects as the genetic condition these children were suffering from.

Thus Merck & Co went to work and eventually developed Finasteride which was approved in 1992 by the U.S Food and Drug Administration (FDA) for the treatment of BPH. The drug is marketed by Merck under the brand name Proscar. In 1997, Merck was successful in obtaining FDA approval for a second lower dose version of finasteride for the treatment of Male Pattern Baldness (MPB). This was marketed under the brand name Propecia.

How does Finasteride work?

Finasteride is a 5-alpha reductase inhibitor, meaning it prevents the enzyme 5 alpha reductase from converting testosterone into DHT. Prostate growth and size is largely dependent on DHT levels. There are two types of 5 αlpha-reductase; type 1 which is present in tissue, such as liver or skin and type 2, which is the predominant type present in the prostate. This enzyme is critical to the normal development of the prostate and hyperplastic growth later in life. Finasteride acts as an inhibitor of type 2 5α-reductase enzyme.

Studies have revealed that Finasteride reduces intraprostatic DHT level by 91.4%. However despite the concerns about this substantial reduction, advocates and Merck have argued Finasteride does not reduce DHT level so much as to chemically castrate you. This is because circulating testosterone is converted to DHT by the type 1 isoenzyme, existing in the skin and liver. This being said Finasteride may have the worst sexual side effects of all of the drugs examined in this report.

By lowering DHT levels Finasteride actively decreases the size of the prostate. However, this process takes between 3 and 6 months before the clinical effects kick in and the prostate reduces in size. Therefore the efficacy of finasteride and 5 alpha-reductase inhibitors cannot be felt till a patient has been on the medication for a very long period of time. Unfortunately, side effects can begin to manifest in a matter of days or weeks and can get worse over time.

Finasteride is most often prescribed for men with substantially enlarged prostates, prostates above 40 or 50 grams. These are men who are at the greatest risk of disease progression, experience moderate-to-severe lower urinary tract symptoms, and acute urinary retention.

Is Finasteride safe? Does it have side effects?

To evaluate the safety of Finasteride, a 4-year placebo-controlled study of 1,524 patients treated with Finasteride and 1516 patients treated with placebo were followed over a period of 4 years.

The most frequently reported adverse reactions were related to sexual function

- 8.1 % of men reported regular impotence
- 6.4 % of men reported decreased libido
- 3.7% of men saw a decreased volume of ejaculate

Less common side effects include: growth of male breasts; tenderness, soreness and pain in male breasts; rashes, allergic reactions, itching, hives, and swelling of the lips and face.

Some men reported testicular pain, and there was a weak link to increased risk of developing male breast cancer.

Other studies have since reported that Finasteride may reduce the incidence of prostate cancer, although these are controversial results. It appears that Finasteride may lower your risk of slow growing prostate cancers while increasing your risk of aggressive prostate cancer. The largest study investigating prostate cancer prevention with Finasteride was published in 2003 . It found a 24.8% risk reduction in the prevalence of prostate cancer over seven years. However, it also noted an alarming increase in high-grade 7 or above tumors in the Finasteride group (37%) versus the placebo group (22%).

According to Patrick C. Walsh, M.D., University Distinguished Service Professor of Urology at Johns Hopkins Medicine, Finasteride prevents you from knowing that you could have prostate cancer. Even worse, taking finasteride may mask the signs of aggressive - yet

curable - prostate cancers until later in their growth, which may make them more lethal. New research also shows that the sexual and cognitive side effects of finasteride can persist for as long as 10 years after men stopped taking the drug. A 2014 meta study coined the phrase ***"Post Finasteride Syndrome"***, and noted that, "*Many clinicians are unaware of the scope of the persistent physical and psychological adverse effects of finasteride. Symptoms range from minor to severe.*"

The meta study examined 12 research papers that all showed high percentages (80-90+ percent) showing persistent and long lasting sexual and psychological side effects.

A Notable 2011 research paper had the highest percentages: *"96% of the men in the study who took finasteride experienced sexual problems lasting for more than a year after they stopped taking the drug."*

In another large scale drug report from 2017, 103 young men (16-42 years old) who were taking low dose finasteride for hair loss developed ED. **In a third of them (33%), ED persisted after stopping the medication.** The study also noted that the longer men took finasteride or dutasteride, the higher their risk. Men who had taken finasteride for a period of 205 days had a 4.9-fold higher risk of Persistent Erectile Dysfunction (PED) than men with shorter exposure.

Does Finasteride alleviate symptoms?

Just after it was approved by the FDA, a large scale study was conducted examining the efficacy of Finasteride. 895 subjects with BPH were randomized to receive placebo or 1 or 5 mg of Finasteride over 1 year (Gormley, 1992). The primary outcome measures consisted of a symptom score and a peak flow rate, although measurements of prostate size were also recorded.

The symptom score measures the total scores of nine symptoms: decreased urinary stream, dribbling, interruption in the stream, hesitancy, feeling of incomplete emptying, straining to initiate flow, urgency, incontinence, and dysuria.

The group taking the the normal 5 mg oral dose of finasteride per day showed a statistical improvement in symptoms (21% improvement) compared with the placebo group (just 2%). Another group taking a lower dose of finasteride (1mg oral per day) saw no statistical improvement in symptoms over the placebo group.

Further studies have demonstrated that this response is associated with prostate size at the beginning of the treatment. Boyle et al, 1996, undertook a meta-analysis of six randomized, placebo-controlled clinical trials to provide a more thorough consensus. The