

## Additives to Minoxidil Compounds

**\*Finasteride:** a 5-alpha reductase enzyme inhibitor and reducer of DHT levels. When taken orally finasteride (Propecia) and dutasteride (Avodart) are systemic alpha reductase enzyme inhibitors and can have systemic side effects such as libido issues and breast growth. Adding topical finasteride to the hair loss formulation works synergistically with the other ingredients to halt further hair loss and promote thickening and regrowth with less systemic side effects.

*Note: Finasteride should not be used in women of child bearing age.*

### Warnings and Precautions:

**Using both oral and topical Finasteride may lead to unwanted side effects. We do not recommend using these products together.** Anyone with a history of allergy to Minoxidil or other components of the product should not use this medication. Minoxidil has potentially serious side effects if absorbed in large amounts into the body. Persons with a history of heart disease should consult their doctor before using this product. Do not apply to irritated, blistered, bleeding, or broken skin. Do not use more than the recommended dose, and do not apply it more frequently than twice a day. Do not use hairdryers to accelerate drying of the medication.

### Contraindications

Skin and Scalp - Topical should not be applied to inflamed, infected skin or skin with open wounds.  
*PLEASE REFER TO OUR PATIENT ADVISORY LEAFLET FOR MORE INFORMATION.*

### In addition to Minoxidil, your product may contain one or more of the following ingredients:

**Retinoic Acid:** may improve the ability of Minoxidil to stimulate the regrowth of hair in persons afflicted with Male Pattern Baldness and may also directly stimulate the hair follicles. Clinical trials using topical Retinoic Acid combined with Minoxidil indicate that this combination may increase hair regrowth by up to 100%. Hair loss clinics report that existing hair becomes stronger and thicker after two to three months of combined 2% Minoxidil and 0.025% Retinoic Acid applied topically. 80% of patients achieve some regrowth of hair after six months of this treatment and 90% of patients experience regrowth within one to two years of this treatment. After two years, hair regrowth is often strong and healthy. Retinoic Acid may improve the absorption of Minoxidil into the dermis of the scalp where the hair follicle is located. Although the exact mechanism of action of Retinoic Acid on hair growth is not yet known, evidence suggests that Retinoic Acid may decrease the cohesiveness of the Epithelial Cells of the hair follicles; and may act on the skin of the scalp as a minor skin peel, thereby permitting more of the active ingredients in other hair restorative formulas to permeate through to lower layers of the skin of the scalp so that they can reach the hair follicles and exert their activity. One female subject with pronounced alopecia for more than 20 years had regrowth of hair using only tretinoin (Retinoic Acid) for a period of 18 months. Tretinoin (Retinoic Acid) has been shown to promote and regulate cell proliferation and differentiation in the epithelium and may promote vascular proliferation. These factors are important for hair growth promotion.

**Azelaic Acid:** Azelaic acid may be incorporated into solution either alone or in combination with minoxidil to topically decrease DHT levels. In vitro, azelaic acid acted as a scavenger of oxy radicals and inhibits a variety of oxidoreductive enzymes including 5-alpha reductase, the enzyme responsible for converting testosterone to DHT. Azelaic acid (0.1 to 3.0 mmol/l) has been shown to produce a competitive concentration dependent inhibition of 5-alpha reductase activity in homogenates of human foreskin. Azelaic acid is being studied for potential antimycotic and antiviral properties. The multiple actions of azelaic acid cause a normalization of keratinization and a decrease in the free fatty acid content of skin surface lipids. It also helps to maximize the absorption of Minoxidil.

**Hydrocortisone:** is a class of drugs called steroids, it reduces swelling and decreases the body's immune response. We use it to decrease inflammation and irritation with higher dose Minoxidil preparations. HC is effective in alopecia areata as an adjunct to injected steroids.

**Progesterone:** a hormone produced by both men and women which completes the 5 alpha reductase enzyme that converts serum testosterone to DHT. With age, the production of progesterone decreases. **(2% leave-in applied topically)** may retard further hair loss and may stimulate some regrowth of hair in men and women afflicted with androgenetic hair loss and hormone imbalances.

**Vitamin E:** known to increase blood circulation to all areas of the body (including the scalp). It can help your hair absorb more essential nutrients and minerals. This is always added to our **Acetyl-Glutathione/Biotin 3%** formula and all Minoxidil formulas.

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## More Hair Growth Compounds Offered at MAA

Dutasteride was the FIRST dual acting 5 alpha reductase inhibitor blocking both Type I and Type II 5-alpha reductase enzymes that convert testosterone to DHT. Propecia (finasteride), the oral drug approved by the FDA to treat male pattern baldness, only inhibits Type II 5 alpha reductase enzyme. Men with male pattern baldness have increased levels of the hormone DHT and the hair follicles in the balding areas of the scalp become miniaturized. Like finasteride, DUTASTERIDE interrupts a key factor in the development of androgenetic or male pattern baldness but to an even greater extent. Dutasteride at a daily dosage of 0.5mg/ day has been shown to reduce serum levels of DHT by over 90%. Like finasteride, the active ingredient in Propecia, dutasteride or Avodart has initially been approved by the FDA for the treatment of prostatic enlargement Preliminary studies have shown Dutasteride to be as SAFE as Propecia but significantly more effective in decreasing DHT levels and treating Male Pattern Baldness.

**Spironolactone:** (applied topically to the scalp) in clinical trials with persons afflicted with MPB resulted in 50% of persons exhibiting a 10% or greater number of new hairs on their heads after twelve months of therapy. This indicates that Spironolactone may be utilized as an adjunct to other treatments for MPB or FPB. Typically dosed in 2-5% stand-alone solutions or lotions. Spironolactone cannot be mixed with minoxidil due to incompatibilities. It also quickly degrades when exposed to heat and light. A better choice is azelaic acid.

**Ketoconazole Rx:** (Shampoo applied topically) is speculated to inhibit Superoxide Free Radical-induced damage to hair follicles that underlies Male Pattern Baldness and may also inhibit the binding of Dihydrotestosterone (DHT) to hair follicles. Ketoconazole (Shampoo applied topically) may stimulate new hair growth in persons afflicted with Male or Female Pattern Baldness.

**Acetyl Glutathione:** the body's only naturally manufactured antioxidant. Acetyl Glutathione MATURES the hair follicle. Our Acetyl Glutathione is compounded with 3% Biotin in a Propylene glycol base - the Biotin promotes growth of immature hairs and the Acetyl Glutathione promotes the maturation of the hair follicle. Acetyl-Glutathione effects: Anti-inflammatory, Mitochondrial stimulation and increased number of Mitochondria, Anti-fungal and Anti-viral effects, Detoxifies DHT and Xenoestrogens found in hair care products. Glutathione exerts Antioxidant effects that protect hair follicles from Free Radical damage. Inactive hair follicles are deficient in Glutathione. This product is used at the hairline and temples prior to applying Minoxidil in men and women. Note: Hair health involves the follicle. 1/3 of hair is in the growing phase, 1/3 is in hair loss phase, and 1/3 is in the process of development to maturity. The goal is to protect the DNA and prevent free radicals from breaking down the cells in the follicle.

**Biotin:** (ingested orally) may retard the rate of hair loss in persons afflicted with Male or Female Pattern Baldness. Biotin (specialized form applied topically to the scalp in a 3% strength) may facilitate hair growth in persons afflicted with Male/Female Pattern Baldness.

**Melatonin:** applied topically 0.1% may facilitate hair growth in persons afflicted with Male/Female Pattern Baldness. [View the study here \(http://www.ncbi.nlm.nih.gov/m/pubmed/23766606/\).](http://www.ncbi.nlm.nih.gov/m/pubmed/23766606/)

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## Other Potential Hair Growth Ideas

**Taurine:** may help to prevent/treat Male/Female Pattern Baldness (by inhibiting the process of Fibrosis in the sheath that surrounds hair follicles (known as perifollicular Fibrosis). Also found in our product ZEN.

**Zinc:** may be of some use in the treatment of Male Pattern Baldness (due to Zinc inhibiting the 5-Alpha Reductase enzyme that catalyzes the production of the hormone involved in Male or Female Pattern Baldness - Dihydrotestosterone (DHT). We recommend Zinc Picolinate for promoting hair growth in Male Pattern Baldness sufferers. Please see our [Hormone Manager for Men and Women](#).

**Cimetidine:** (1,500 mg per day administered as 5 x 300 mg oral doses per day) may cause hair regrowth in up to 70% of women afflicted with Female Pattern Baldness (Male Pattern Baldness can affect women as well as men - the effectiveness of Cimetidine for female MPB stems from its ability to function as an Antiandrogen). Cimetidine is NOT recommended for Male Pattern Baldness patients at it may cause feminizing effects. Cimetidine works against Male Pattern Baldness by blocking the binding of Dihydrotestosterone (DHT) to Androgen Receptors.

**The Nicotinic Acid form of Vitamin B3:** (applied topically to the scalp) may help to improve blood circulation to the scalp (and may thereby help to retard Male Pattern Baldness). In one study a cream containing Biotin and Vitamin B3 applied topically at night caused hair regrowth in 75% of Male Pattern Baldness subjects. May be used in women too.

**Ginkgo biloba:** may facilitate hair growth in Male and Female Pattern Baldness sufferers (by increasing blood circulation to the hair follicles).

**Green Tea:** may inhibit the effects of Androgen Hormones that cause Male/Female Pattern Baldness (due to the Catechins-Tea Polyphenols-in Green Tea).

**Saw Palmetto:** (berries ingested orally) may retard further hair loss in persons afflicted with Male/Female Pattern Baldness (due to the Phytosterols in Saw Palmetto inhibiting the conversion of Testosterone to Dihydrotestosterone by the 5-Alpha-Reductase enzyme) and Saw Palmetto (extract applied topically to the scalp) also retards further hair loss. We recommend [Hormone Manager for Men and Women](#).

**Flax Seeds:** may retard the progression of hair loss in people with Male/Female Pattern Baldness (due to the Plant Lignans content of Flax Seeds inhibiting the binding of Dihydrotestosterone (the Hormone believed to cause androgenetic alopecia to Sex Hormone Binding Globulin (SHBG).

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(1) <http://www.accessdata.fda.gov>

(2) Micromedex® 2.0, (electronic version). Truven Health Analytics, Greenwood Village, Colorado, USA. Available at: <http://www.micromedexsolutions.com/> (cited: 01/27/2015).

(3) Wendt, A., et al. Systemic effects of local antiandrogen therapy. Arch Dermatol Res. 273:171, 1982.

(4) Revolutionary treatments for baldness: the hair regrowth formulas of Peter Proctor, M. D., Ph.D. Life Extension. 3(3):2-8, 1997.

(5) Ferry JJ, et al. Influence of tretinoin on the percutaneous absorption of minoxidil from an aqueous topical solution. Clin Pharmacol Ther (1990) 47:439-46.

(6) Gazzano GS, et al. Topical tretinoin for hair growth promotion. J Am Acad Dermatol (1986) 15:880-883.

(7) Shin HS, et al. Efficacy of 5% minoxidil versus combined 5% minoxidil and 0.01% tretinoin for male pattern hair loss: a randomized, double-blind, comparative clinical trial. Am J Clin Dermatol. 2007;8(5):285-90. vi

(8) Lewenberg A. Treatment of alopecia with a minoxidil-tretinoin combination. Adv Ther. (1991) 8:190-198.

(9) Kligman AM, et al. Topical tretinoin for photoaged skin. J Am Acad Dermatol. 1986 Oct;15(4 Pt 2):836-59.

(10) Hair regrowth was noted in Minoxidil-treated groups by month 4, with regrowth peaking at month 12. (Koperski, JA: 1987.)

(11) Clinical findings show significant improvements in 51% of men using 5% Minoxidil, 42 percent using 2% Minoxidil, and 13% of placebo users, even in the frontal area after 48 weeks of treatment. (Olsen E: 2003.)

(12) Absorption

Topical: 1.6 to 3.9% of the topically applied Minoxidil dose is absorbed percutaneously (Franz, TJ: 1985) To offset this low percutaneous absorption rate, MDF is custom compounded as a topical 15% Minoxidil solution without an absorption enhancer, which provides an equivalent or superior bioavailability of Minoxidil as OTC 5% Minoxidil with an absorption enhancer, such as high concentrations (>20%) of propylene glycol, which have been shown to cause itching, scalling or scalp irritation in 6% of patients (Hogan, DJ: 2000, Cantanzaro, JM: 1991).

(13) Dosage and Administration

Adults - (topical) - Apply 15% (500 mg/3.3 ml) qd to affected scalp areas. If unresponsive, greater absorption may be achieved by splitting the total daily dose into two applications. These applications should be spaced at least 4 hours apart, since 75% of Minoxidil is absorbed within 4 hours of application. (Ferry, JJ:1990)

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