


# Removal of Unwanted Facial Hair

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**Unwanted facial hair is a common problem that is seldom discussed in the primary care setting. Although men occasionally request removal of unwanted facial hair, women most often seek help with this condition. Physicians generally neglect to address the problem if the patient does not first request help. The condition may be caused by androgen overproduction, increased sensitivity to circulating androgens, or other metabolic and endocrine disorders, and should be properly evaluated. Options for hair removal vary in efficacy, degree of discomfort, and cost. Clinical studies on the efficacy of many therapies are lacking. Short of surgical removal of the hair follicle, the only permanent treatment is electrolysis. However, the practice of electrolysis lacks standardization, and regulation of the procedure varies from state to state. Shaving, epilation, and depilation are the most commonly attempted initial options for facial hair removal. Although these methods are less expensive, they are only temporary. Laser hair removal, although better studied than most methods and more strictly regulated, has yet to be proved permanent in all patients. Eflornithine, a topical treatment, is simple to apply and has minimal side effects. By the time most patients consult a physician, they have tried several methods of hair removal. Family physicians can properly educate patients and recommend treatment for this common condition if they are armed with basic knowledge about the treatment options. (Am Fam Physician 2002;66:1907-11,1913-4. Copyright© 2002 American Academy of Family Physicians.)**

 A patient information handout on removal of unwanted facial hair, written by the authors of this article, is provided on page 1913.

**U**nwanted facial hair is a common condition that often goes untreated. Women most often seek treatment, but men may also have concerns about this problem.<sup>1</sup> In most cases, a severe underlying medical condition is not the cause of unwanted facial hair. Its presence, however, causes significant psychologic stress and may lead patients to resort to uncomfortable and often expensive means of removal.

## Hair Growth Cycle

The growth of human hair is cyclic, involving phases of active growth (anagen) and quiescence (telogen). In addition, an intermediate stage of transition, known as catagen, occurs between active growth and cessation of growth. Between 85 and 90 percent of hairs are in the anagen phase at any one time, with the remainder in telogen.<sup>2-4</sup>

During the anagen phase, mitotic activity in the hair bulb and dermal papilla resumes and forms the new hair shaft, pushing out the old inactive hair, or club hair, as the new hair advances. The matrix cells, which form the new hair, multiply rapidly and ascend into the

follicular canal, dehydrate, and form the growing shaft. The visible hair shaft is composed of an outer cuticle, the cortex and, sometimes, a core of compact, keratinized cells, all of which are made of protein.<sup>2-5</sup>

Hairs that are in the anagen phase during removal are more sensitive to the various treatment modalities than hairs in the telogen phase. Alteration of matrix cell activity during anagen, by whatever method chosen, increases the amount of time from removal to regrowth. As a result, one of three alterations can occur: early cessation of anagen causing telogen to occur, transition into a dystrophic stage of anagen, or degeneration of the matrix.<sup>5-8</sup>

Depending on the site of the hair, the time spent in each phase differs considerably, from an anagen phase of two to six years for scalp hair to one to two months for thigh hair. The telogen phase also varies, ranging from one and one half months for mustache hairs to three to six months for leg hairs.<sup>5</sup> During telogen, growth stops, and the entire structure rests for a variable period of time, depending on the site. Once anagen begins, the remaining club hair is ejected, and the growth cycle continues.

See page 1856 for definitions of strength-of-evidence levels.

*Women with abnormal hair-growth patterns should be evaluated for overproduction of testosterone and other androgens.*

Patterns of hair growth vary greatly depending on whether the patient is male or female. In addition, ethnicity may also determine normal growth patterns that can be interpreted as abnormal by physicians outside of a patient's native culture. Growth of androgen-sensitive hairs at various regions of the body (beard, axillae, pubis, chest, and shoulders, for example) can arouse suspicion of an underlying organic cause.<sup>2,3</sup> Overproduction of testosterone and other androgens in female patients may cause abnormal growth patterns that can be clinically evident as hirsutism.<sup>2,3</sup> All such patients should be evaluated for an underlying cause of the hair growth, whether the unwanted facial hair is to be treated or not.

### **Methods of Hair Removal**

Several methods of hair removal are available, each with varying degrees of cost, efficacy, and side effects. Methods of hair removal are summarized in *Table 1*.

#### **SHAVING**

Shaving does not change the thickness or growth rate of human hair.<sup>5,9</sup> Rather, the rough-textured, beveled edge that shaving produces (compared with the softer, tapered tip of uncut hair) may give the appearance of thickening.<sup>5,6</sup> Although shaving is a useful and safe method of facial hair removal (and the chief method chosen by men), it is not popular among women.

Side effects of shaving are generally minimal. Irritation, often caused by components of the shaving lubricant, and minor cuts can occur. Pseudofolliculitis barbae, caused by the ingrowth of curly hair, is also a fairly common side effect in some ethnic groups.<sup>5</sup>

#### **EPILATION/DEPILATION**

Epilation, or plucking, is often the first method chosen by patients. The entire hair shaft and bulb are removed, with results lasting six to eight weeks.<sup>5,10</sup> While this method is probably the least expensive, it is not practical for use over larger areas. Unless the hair is plucked in anagen, the method generally does not change the growth rate of hair.<sup>11,12</sup> Plucking during anagen may shorten the duration of time spent in this phase and, if repetitive, may permanently damage the matrix.<sup>5,6</sup>

Numerous methods are used for epilation, from tweezers to devices that pluck several hairs at once. Hot or cold waxing is also a form of epilation. Mixed with the wax is a resin that hardens around the hair shaft and aids in pulling out the hair when the wax has dried. Side effects, which are more common when more than one hair is removed at a time, include burns (from hot wax products), folliculitis, pseudofolliculitis, postinflammatory hyperpigmentation, and scarring.<sup>5,13</sup>

Depilation is the use of a chemical that dissolves the hair shaft, with results lasting up to two weeks.<sup>5,14</sup> Composed of thioglycolates and mercaptans, and mixed with an alkali compound (calcium hydroxide or sodium hydroxide), depilatories do not affect the hair bulb.<sup>5,14</sup> The thioglycolates disrupt disulfide bonds between the cystine molecules found in hair, helping to dissolve the hair shaft.<sup>5,14</sup> The addition of an alkali compound increases the pH level and can improve the efficacy of the depilatory.

Side effects include chemical dermatitis and, occasionally, allergic dermatitis from the sulfur-containing thioglycolates or fragrance added to the compound. The thioglycolates produce hydrogen disulfide gas, a particularly offensive-smelling byproduct.<sup>5,14</sup>

#### **LASER**

The use of lasers in hair removal allows selective targeting of the hair bulb and can diminish regrowth for at least three months.<sup>2,5,6,15,16</sup> [Ref-

erence 15—Evidence level B, nonrandomized clinical trial] Evidence of permanent hair removal has yet to be established but is under investigation.

The basis for laser hair removal is the specific targeting of melanin in the hair bulb. Melanin absorbs the light emitted by the laser at a specific wavelength. The energy of the laser converts into heat, causing the selective destruction of the hair bulb. However, melanin in the surrounding epidermis can also be targeted, which may limit the success of the procedure. With too much melanin in the adjacent skin, the laser energy is absorbed into the surrounding epidermis, causing epidermal

damage or absorptive interference with less effective hair destruction. Patients with dark hair and light skin have a relatively higher concentration of melanin in the hair compared with the epidermis, allowing for more selective absorption of light within the hair bulb, reducing damage to or interference by the melanin in the epidermis. Conversely, gray or white hair is a poor target for laser energy.

The most common side effects of laser hair removal are edema and erythema, which generally resolve within 24 hours after treatment. The process itself can be slightly painful because of the short burst of heat energy created. Furthermore, hypopigmentation and

**TABLE 1**  
**Summary of Hair Removal Methods**

<i>Method</i>	<i>Side effects</i>	<i>Permanence</i>	<i>Cost</i>
Shaving	Chemical dermatitis, minor cuts, pseudofolliculitis barbae	One to three days	Variably inexpensive
Epilation: plucking/waxing	Pain, folliculitis, pseudofolliculitis, burns, irritation, postinflammatory hyperpigmentation, scarring	Two to eight weeks	Least expensive
Depilation: chemical	Chemical dermatitis, occasionally allergic dermatitis	Up to two weeks	Variably inexpensive
Laser	Edema, erythema, pain, hypopigmentation, hyperpigmentation	At least three months	Variable but approximately six to eight sessions (depending on site and skin/hair color), at \$75 to \$250 per session
Electrolysis	Edema, erythema, pain, scarring, keloid formation, postinflammatory pigment changes. Cannot be used by patients with pacemakers.	Considered to be permanent but depends on method and operator	About \$18 to \$25 per 15-minute session; variable number of sessions initially, followed by maintenance
Topical: eflornithine (Vaniqa)	Acne, pseudofolliculitis barbae, stinging, burning	Up to eight weeks after discontinuing treatment	Approximately \$50* for one month of twice-daily treatment

\*—Estimated cost to the pharmacist based on average wholesale prices in Red book. Montvale, N.J.: Medical Economics Data, 2001. Cost to the patient will be higher, depending on prescription filling fee.

*Electrolysis, if performed correctly, is considered to be a permanent method of hair removal.*

hyperpigmentation may occur and are related to skin color.<sup>2,5,6,15-18</sup>

#### **ELECTROLYSIS**

Although electrolysis is a common method of hair removal, its practice is the least standardized. Regulation of the process varies from state to state. In addition, no controlled trials have evaluated the efficacy of the procedure. Success depends on the skill of the operator.<sup>5,19,20</sup> However, electrolysis is considered to be a permanent method of hair removal. An electric current is passed through a fine-gauge needle or flexible probe inserted into the skin, destroying the follicular isthmus and lower follicle. In one study,<sup>21</sup> this led to permanent removal of the hair.

The two basic methods of electrolysis are galvanic and thermolytic. Galvanic electrolysis is the more common method. It destroys the hair follicle using a direct current–induced chemical reaction. The process is variably slow, and repeat treatments are often necessary. Thermolysis uses an alternating current that creates heat within the follicle, causing its destruction. Depending on the operator, the equipment, and the method used, the process

can take from 0.02 to 20 seconds per hair. Electrolysis is usually performed on all types of hair but is most effective on hairs in the anagen phase.<sup>5,19-22</sup>

Side effects of electrolysis, which include pain, erythema, and edema, are generally temporary. Scarring, keloid formation in susceptible patients, and postinflammatory pigment changes are possible. Patients with pacemakers should not undergo electrolysis, regardless of the method.<sup>5,20</sup>

#### **TOPICAL**

Several oral medications have successfully reduced the growth of facial hair (e.g., spironolactone [Aldactone], third-generation oral contraceptives, cimetidine [Tagamet]), but long-term safety and efficacy data are lacking.

Recently, however, the first topical medication for the treatment of unwanted facial hair has demonstrated success.<sup>1</sup> Eflornithine (Vaniqa), an irreversible inhibitor of ornithine decarboxylase, has also been used to treat African sleeping sickness in intravenous and oral forms.<sup>23,24</sup> In animal studies, inhibition of ornithine decarboxylase reduced cell division and other cell functions that are necessary for hair growth. Topical application in humans has been shown to remove facial hair, an effect that may last as long as eight weeks after therapy is discontinued. Currently, eflornithine is indicated only for the removal of unwanted facial hair in women.<sup>1,24-27</sup>

In two randomized, double-blind studies, eflornithine removed unwanted facial hair within four to eight weeks of regular use.<sup>24</sup> This hair loss was deemed a “marked improvement” in approximately 32 percent of patient reports when compared with placebo and was accompanied by a significant reduction in the amount of time patients spent removing hair by other means.

Although eflornithine is indicated as a stand-alone treatment, it may improve the success of laser hair removal when the two are used in conjunction.<sup>1</sup> If the medication is well tolerated, it can be continued as long as it is

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effective. Hair growth usually returns to pre-treatment levels within eight weeks of discontinuing the medication.<sup>1</sup> While eflornithine is a useful option, it is not a practical first-line therapy. It is perhaps best used in patients sensitive to physical methods of hair removal or to augment one of these methods.<sup>1</sup>

Eflornithine is a pregnancy category C medication, and it is not known whether it is excreted in human breast milk. The most common side effects are acne, erythema, and burning and stinging of the skin. These symptoms generally resolve without the need for treatment or discontinuation of eflornithine.<sup>24-27</sup>

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*Topical application of eflornithine (Vaniqa) removes facial hair for up to eight weeks after discontinuation of use.*