

# Nonlaser Hair Removal Techniques

Author: Alicia Barba, MD, Staff Physician, Department of Dermatology, University of Miami  
Coauthors: Leslie Stafford Baumann, MD, Director of Cosmetic Dermatology,  
Assistant Professor, Department of Dermatology, Cedars Medical Center

**M**ANY MEN and women choose to remove unwanted body hair for cosmetic, social, cultural, or medical reasons. Medical indications for hair removal include hirsutism, which is excess terminal hair in the distribution of hair growth influenced by androgens (face, chest, back, abdomen) or hypertrichosis, which is congenital or drug-induced increase in hair growth in areas that are not androgen dependent. Other medical indications include pseudofolliculitis, hair growth from a grafted donor site, and sex change operations performed in men.

Many methods are available for temporary or permanent hair removal, each with its own relative efficacies and adverse effects. Different methods for the removal of body hair include the following:

- **Temporary hair removal**

Shaving, Epilation, Depilatories and Bleaching

- **Temporary hair reduction**

Vaniqa (eflornithine hydrochloride [HCl] 13.9%)

Laser-assisted hair removal

- **Permanent hair removal**

Electrolysis

## Shaving

Shaving is the method used most frequently to remove unwanted hair temporarily. It is fast, easy, painless, effective, and inexpensive. Results are temporary, lasting 1-3 days, and shaving requires a constant commitment to maintaining a hair-free appearance.

Shaving is performed with a razor on wet skin using shaving cream or other lubricants, with the razor oriented against the direction of hair growth. For sensitive areas, shaving in the direction of hair growth may reduce cuts. Contrary to a widespread misconception, shaving does not result in increased hair growth. The primary disadvantages and/or adverse effects from shaving include skin irritation, cuts in the skin, ingrown hair pseudofolliculitis, the need to shave daily, and stubble.

## Epilation

Epilation involves the removal of the entire hair shaft and is the most effective method for temporarily removing hair. Epilation includes waxing, plucking, threading, sugaring, and using abrasives or mechanical devices, such as the Epilady. For epilation to be effective, treated hairs should be long enough for the device to grasp. The long-term effects of epilation on the hair follicle are not known, and it is unclear whether it may result in long-term reduction of hair regrowth. Since epilation wounds the hair follicle, repetitive epilation may result in permanent matrix damage, resulting in finer or thinner hairs.

## Plucking

Plucking is performed best using tweezers and is a beneficial and economic method for removing the occasional coarse hair or a small group of hairs, such as those found on the eyebrows, chin, or nipples. The results of plucking last longer than shaving, since hair is pulled from the hair shaft, as in waxing. This method is time consuming, tedious, and painful. The reaction of the hair follicle to plucking can be unpredictable in some women, resulting in folliculitis, hyperpigmentation, scarring, ingrown hairs, and distorted follicles.

## Waxing

Waxing is similar to plucking and involves applying warm or cold wax onto hair-bearing skin and quickly stripping off the hardened wax and embedded hairs against the direction of hair growth. Waxing is the most expensive yet most effective method of epilation since hair is removed completely from the hair shaft in large quantities. Often, hair can take 2-3 weeks to regrow. The effects on the hair follicle of long-term waxing are unknown, and theoretically, it is possible that this modality may reduce regrowth because repeated waxing may destroy follicles. Although many kits are offered for use at home, faster and more successful

results are obtained by an experienced salon-based operator.

Although no formal studies have been conducted, it is recommended that patients using systemic retinoids (i.e., Accutane, Soriatane) refrain from waxing until treatment has been discontinued for a minimum of 6 months to 1 year to avoid tearing of the skin and scarring. Patients using topical retinoids (i.e., Retin-A, Differin, Avita) should be careful to avoid injuring the skin. Waxing should not be performed on moles or skin that is irritated, sunburned, or broken. Pay special attention to the temperature of the wax to avoid burning the skin.

## Threading

Threading is an ancient manual technique, popular in many Arabic countries, that involves the use of a long twisted loop of thread rotated rapidly across the skin. By maneuvering the twisted string, hairs are trapped within the tight entwined coils and are pulled or broken off. Adverse effects are similar to plucking.

## Abrasives

Abrasives such as pumice stones and devices or gloves made of fine sandpaper work by physically rubbing the hair away from the skin surface. This method can be irritating to the skin and is not used commonly today for hair removal.

## Sugaring

Sugaring is similar to waxing. The sugar mixture is prepared by heating sugar, lemon juice, and water to form a syrup. The syrup is formed into a ball, flattened onto the skin, then quickly stripped away. Similar to waxing, the hair is removed entirely from the hair shaft, and sugaring is an alternative to waxing for people sensitive to wax.

Adverse effects from plucking, waxing, threading, and sugaring include pain, hyperpigmentation, scarring, folliculitis, and ingrown hair pseudofolliculitis.

Editors: Zoe Diana Draelos, MD, PA, Clinical Associate Professor, Department of Dermatology, Wake Forest University; Clinical Associate Professor, Department of Dermatology, Bowman Gray School of Medicine; David F Butler, MD, Professor, Texas A&M University College of Medicine, Director, Division of Dermatology, Scott and White Clinic; Christen M Mowad, MD, Assistant Professor, Department of Dermatology, Geisinger Medical Center, Pennsylvania State College of Medicine; Joel M Gelfand, MD, MSCE, Assistant Professor, Department of Dermatology, Center for Clinical Epidemiology and Biostatistics, University of Pennsylvania Hospital; and Dirk M Elston, MD, Consulting Staff, Department of Dermatology, Geisinger Medical Center

## Depilation

Chemical depilatories remove part of the hair shaft and are easy and painless to use. The standard chemical depilatory agents, available in gels, creams, lotions, aerosols, or roll-on forms, are the salts of thioglycolic acid (sodium or calcium thioglycolate) that were patented in the 1930s for dehairing cattle hides. Thioglycolate depilatories work by hydrolyzing and disrupting disulfide bonds of hair keratin, causing the hair to break in half and allowing the hair to separate from the skin. Depilatories are good for use on the legs, bikini line, face, and underarms, and they perform best when hair is at a reasonable length. Before using a depilatory, carefully read the manufacturer's instructions. Test a small site before use to assess for irritation or allergic reactions. Do not use these agents on eyebrows, near mucous membranes, or on broken skin.

Adverse effects include skin irritation, burns, folliculitis, ingrown hairs, and allergic contact dermatitis to either thioglycolate or fragrances.

## Bleaching

Bleaching is not a method of hair removal, but many women use bleaching as an inexpensive method of disguising the presence of unwanted hair by removing the hair's natural pigment. Common sites for bleaching include the upper lip, beard area, and arms. The active ingredients in over-the-counter bleaching agents are hydrogen peroxide and sulfates as activating agents, a combination that bleaches, softens, and oxidizes hair. A variety of commercial bleaches are available, and the manufacturer's instructions are easy to follow. As with chemical depilatories, perform a small patch test to assess for allergic reaction.

The disadvantages of bleaching include skin irritation, temporary skin discoloration, pruritus, and the prominence of bleached hair against tanned or naturally dark skin. Reports exist of generalized urticaria, asthma, syncope, and shock in reaction to the persulfate activator added to boost the effect of hydrogen peroxide bleach.

## Eflornithine HCl (Vaniqa)

Eflornithine, a novel method for temporary hair reduction in women, is a topical cream available by prescription only and recently approved by the Food and Drug Administration for the reduction of unwanted facial hair in women. Not a hair remover or depilatory, but a topical cream that decreases the rate of hair growth. Works by inhibiting the enzyme ornithine decarboxylase, an enzyme in human skin that stimulates hair growth. When this enzyme is blocked by the medication, metabolic activity in the hair follicle decreases, and hairs grow in more slowly. It has been studied only on the face and the adjacently involved areas under the chin; therefore, it should be used only in those areas. Since it does not remove hair, it must

be used in combination with the patients' normal hair removal methods (i.e., shaving, waxing, plucking). It is rubbed onto the affected areas on the face twice daily.

**Drug Category:** Dermatologic agents — Approximately 32% of 393 female patients treated with eflornithine in clinical trials showed marked improvement (reduction of unwanted facial hair) compared to only 8% of 201 control subjects who used the vehicle (placebo) alone. These results are based on prerelease clinical trials in which Vaniqa was used bid for 24 wk (6 mo). Improvement often was seen in as few as 4-8 weeks. After discontinuing treatment, facial hair growth was similar to pretreatment levels within 8 weeks.

**Drug Name:** Eflornithine (Vaniqa) — In animals, irreversibly inhibits the enzyme OCD, thus inhibiting cell division and synthetic functions, retarding rate of hair growth. Clinical studies show it retards hair growth in humans.

**Adult Dose:** Apply thin layer to affected areas of face and rub in thoroughly; do not wash treated area for at least 4 hours.

**Pediatric Dose:** Not established.

**Contraindications:** Documented hypersensitivity.

**Interactions:** None reported.

**Pregnancy C:** Safety for use during pregnancy has not been established.

**Precautions:** May cause temporary redness, stinging, burning or tingling, rash, and folliculitis.

## Laser-assisted hair removal

Laser-assisted hair removal is a relatively new method available for long-term hair reduction. Since this topic is beyond the scope of this article, please refer to "Laser Hair Removal Methods" for more information.

## Electrolysis

Electrolysis, also termed electroly, involves the insertion of a small fine needle into the hair follicle, followed by a pulse of electric current that damages and eventually destroys the hair follicle. Multiple treatment sessions are required to achieve a clinically significant result. Electrolysis exists in two types, galvanic electrolysis (direct current electrolysis) and thermolysis (alternating current electrolysis).

## Galvanic electrolysis

In galvanic electrolysis, a direct electric current is passed down a needle inserted into the hair follicle where it acts on tissue saline to produce sodium hydroxide (lye), a caustic agent that destroys the hair bulb and dermal papilla (chemical reaction  $2 \text{NaCl} + 2 \text{H}_2\text{O} = 2 \text{NaOH} + \text{H}_2 + \text{Cl}_2$ ). During the procedure, the patient holds a metal rod covered with conductive cream or gel or a metal plate attached to a moistened pad. The current (milliamperes) is set by the technician

based on the patient's pain threshold, and the duration of the pulse is controlled by how long the technician presses down on the hand or foot pedal. Galvanic electrolysis is slow and may require a minute or more for each hair, including repeated insertions into the follicle.

## Thermolysis

Thermolysis uses a high-frequency alternating current that is passed down the needle into the follicle. The high-frequency alternating current produces heat in the hair follicle via molecular vibration, resulting in destruction of the hair bulb by thermal, not chemical, means.

Most modern electrolysis machines use thermolysis or the blend method, a combination of galvanic electrolysis and thermolysis. Unfortunately, no controlled clinical trials have compared the two methods, and claims of superiority of one method over the other are based on anecdotal evidence.

Significant evidence points to the region of the erector pili muscle insertion as the site of stem cells responsible for hair regeneration. More study is needed to determine to the effects of electrolysis on this region.

Proper electrolysis requires accurate needle insertion technique and appropriate intensities and duration of current. In addition, only anagen phase hairs should be treated, since telogen phase hairs are believed to be more resistant to damage. Anagen phase hairs can be distinguished easily from telogen-phase hairs by shaving the area to be treated and, in a few days time, treating only those hairs visible on the skin surface (anagen phase hairs).

Electronic tweezer devices have been developed for home use; however, since hair is not an electric conductor, current cannot be transmitted via hair to the hair bulb. In addition, no published data prove that damage occurs in the hair follicle or that these devices produce permanent hair removal. Likely, they represent a means for temporary hair shaft removal similar to waxing or plucking.

## Adverse effects

Important and potentially permanent adverse effects of electrolysis include scarring (i.e., keloid formation) and postinflammatory hyperpigmentation or hypopigmentation, adverse effects that are dependent on technician experience and the duration and intensity of the current. Pain, a primary adverse effect of electrolysis, can be diminished with the use of new topical anesthetic creams (eutectic mixture of local anesthetics) one hour prior to the procedure. Maintaining some sensation is desirable, since pain is related to the amount of damage to the hair follicle. Other adverse effects include local bacterial and viral infections. The spread of hepatitis or HIV has not been reported with electrolysis. Electrolysis is not safe for

*continued on page 28*



# FEDERATION OF CANADIAN ELECTROLYSIS ASSOCIATIONS

Enjoy the Benefits:

- Professional Liability Insurance • Newsletter
- Referrals • Networking Opportunity
- Educational Conventions • CPE & CCE Certification

**Call for your FCEA Provincial Affiliate**

**Toll Free/fax 1-888-333-2783**

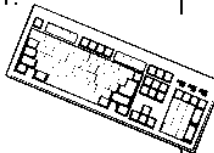
Email: [fcea@fcea.org](mailto:fcea@fcea.org) [www.fcea.org](http://www.fcea.org)

## Market your practice with INTERNET ADVERTISING

For a nominal fee, your private practice can be listed on the AEA Referral Site with any additional information you would like to advertise. The public can then just click on the Referral directory and your ad will appear.



### AEA Members Only. GET CONNECTED!



Name \_\_\_\_\_

Business Name \_\_\_\_\_

Street Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

CPE? yes \_\_\_ no \_\_\_ AEA # \_\_\_\_\_

Phone \_\_\_\_\_ E-mail \_\_\_\_\_

Description: Approximately 25 words that describe your business services. You might want to include modality and office hours.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

### World Wide Web Directory Cost:

\$30.00 per year      \$15 each additional listing

Check# \_\_\_\_\_ Check Date \_\_\_\_\_ Total \$ \_\_\_\_\_

Please make check payable to AEA and send to:

Coral C. Gosnell, CPE

24 Powder Horn Road, Norwalk, CT 06850

OR sign up on: [www.electrology.com](http://www.electrology.com)

Please fill in the application exactly as you wish it to appear.  
NOTE: Changes are made annually upon renewal of ad only.

continued from page 25

patients with pacemakers and should not be used.

### SUMMARY

Temporary and permanent methods of hair removal and/or reduction are an important component in the management of patients with unwanted hair. No single method is perfect for all patients. Factors such as underlying medical conditions causing excessive hair growth, size and location of treatment area, desire for temporary versus permanent hair removal, and the expertise of the technician providing treatment should be considered when choosing a method for hair removal.

### BIBLIOGRAPHY

Bristol-Myers Squibb Company: Physician and Patient Information Leaflet for Vaniqa, July 2000.  
de Berker D: Clinical diagnosis of hirsutism. *Dermatol Ther* 1998; 8: 49-62.

Kligman A.M., Peters L: Histologic changes of human hair follicles after electrolysis: a comparison of two methods. *Cutis* 1984 Aug; 34 (2): 169-76 [Medline].

Natow A.J., Chemical removal of hair. *Cutis* 1986 Aug; 38(2): 91-2 [Medline].

Olsen E.A., Methods of hair removal. *J Am Acad Dermatol* 1999 Feb; 40 (2 Pt 1): 143-55; quiz 156-7 [Medline].

Olsen E.A., Hair removal in hirsutism. *Dermatol Ther* 1998; 8: 68-72.

Richards RN, Meharg G.E., Electrolysis: observations from 13 years and 140,000 hours of experience. *JAA Dermatology* 1995 Oct; 33 (4): 662-6 [Medline].

Richards R.N., Uy M., Meharg G.E., Temporary hair removal in patients with hirsutism: a clinical study. *Cutis* 1990 Mar; 45 (3): 199-202 [Medline].

Scott M.J. Jr., Scott M.J. 3rd, Scott A.M., Epilation. *Cutis* 1990 Sep; 46 (3): 216-7 [Medline].

Woollons A, Price M.L., Roaccutane and wax epilation: a cautionary tale. *Br J Dermatol* 1997 Nov; 137 (5): 839-40 [Medline].

### NOTE:

Medicine is a constantly changing science and not all therapies are clearly established. New research changes drug and treatment therapies daily. The authors, editors, and publisher of this journal have used their best efforts to provide information that is up-to-date and accurate and is generally accepted within medical standards at the time of publication. However, as medical science is constantly changing and human error is always possible, the authors, editors, and publisher or any other party involved with the publication of this article do not warrant the information in this article is accurate or complete, nor are they responsible for omissions or errors in the article or for the results of using this information. The reader should confirm the information in this article from other sources prior to use. In particular, all drug doses, indications, and contraindications should be confirmed.

© Copyright 2004, eMedicine.com, Inc.