

## DEPILATION OR EPILATION BOTH ARE REMOVAL OF UNWANTED HAIR FROM CUTANEOUS LAYER

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### ABSTRACT

The word "depilation" comes from the Latin "pilus" which means "hair". So, de-pilation by depilation or by epilation is the technique to remove hair from skin layer. Depilation is often a generic term used for hair removal, but it specifically includes hair removal methods that remove hair only from the skin's surface, where epilation removes hair from further down, from under the skin's surface directly from the root. With epilation, you get smooth skin that lasts up to 4 weeks. That's because removing hair from the root means that hair takes longer to grow back than removal with surface methods like shaving and creams. Plus, when it does grow back it's softer and finer than before.

**KEYWORDS:** Depilation, Epilation, Epidermis, Dermis, Sweat gland, Sebaceous gland, Stratum basale, Stratum spinosum, Stratum granulosum, Stratum lucidum, Stratum corneum, Papillary layer, Reticular layer, Hair follicle, Adipose tissue, Keratin.

**Skin anatomy:** The skin is the largest organ of the body. The skin and its derivatives (hair, nails, sweat and oil glands) make up the integumentary system. One of the main functions of the skin is protection. It protects the body from external factors such as bacteria, chemicals, and temperature. The skin is the body's largest organ, made of water, protein, fats and minerals.<sup>[1]</sup> Your skin protects your body from germs and regulates body temperature. Nerves in the skin help you feel sensations like hot and cold. The adjective cutaneous means "of the skin". In mammals, the skin is an organ of the integumentary system made up of multiple layers of ectodermal tissue and guards the underlying muscles, bones, ligaments, and internal organs.<sup>[2]</sup>

**Anatomy of the Skin:** There are seven layers of epidermis:

1. Stratum basale.
2. Stratum spinosum.
3. Stratum granulosum.
4. Stratum lucidum.
5. Stratum corneum.
6. Papillary layer.

7. Reticular layer.

**Mechanism of hair removal:** Depilatory creams use thioglycolic acid to break down the keratin protein in your hair. When you rinse the product off, the hair comes off with it. Depilatory creams don't remove the hair at the root like waxing and threading do. Depilatories remove hair below the skin's surface, the results last days longer than shaving. Not only does remove hair, it also gently exfoliates to reveal radiantly smooth skin. Shaving, on the other hand, removes hair at the skin's surface. You can use depilatory creams to remove hair on almost every area of your body. Some creams are specially made for sensitive places, like your face and bikini area. Your hair will grow back quickly after you remove it with a depilatory cream. New hair will usually appear within a few days.<sup>[3]</sup>

**Depilation:** It is the removal of hair, wool, or bristles by chemical or mechanical methods. It is the most effective method for temporarily removing hair.

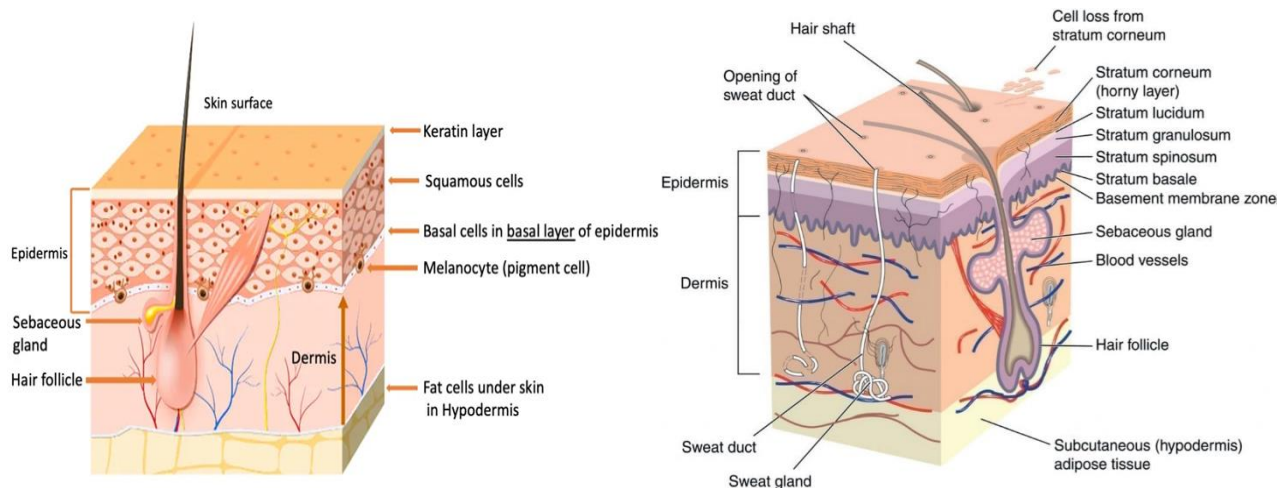
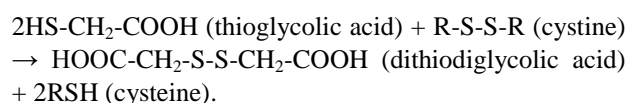


Figure-1: Skin layers.

**Epilation:** It is the term used to describe removal of body hair, including the hair root, by means of mechanical device, tweezer, or wax.



Depilation is often a generic term used for hair removal, but it specifically includes hair removal methods that remove hair only from the skin's surface, where epilation removes hair from further down, from under the skin's surface directly from the root. Depilatory creams are “generally skin safe with little atopic reaction for most, but it can burn with active chemical ingredients such as calcium hydroxide and potassium hydroxide. Depilatory creams don't remove the hair at the root like waxing and threading do. Instead, they make the hair structurally unstable; where exactly the hair breaks under the skin can vary. So, you can expect the hair to regrow faster than it does with waxing, but slower than it does with shaving. With depilatory creams, the results are similar to shaving, about two to three days and as the method only removes the visible hair (not from the follicle itself), you can still see some shadow below the skin. The cream washes off, along with the hair, and simply rinses down the drain. Veet® has a specific foam range designed just for use in the shower which will stay on while you wash, and can be rinsed off when you're ready.<sup>[4]</sup>

Table-1: Ingredients of depilatory formulation.

Ingredients	%
Deionised water	79.85
Sodium Silicate	3.00
Calcium Hydroxide	5.00
Calcium Thioglycolate	4.00
Mineral oil/Glycerine	6.00
Stearyl alcohol	1.25
Sesame oil	0.10
Jjoba ester	0.20
Tocopheryl acetate	0.10
Squalene	0.10
Fragrance	0.40

Chemical depilatories contain 5–6% calcium thioglycolate in a cream base (to avoid runoff). Calcium hydroxide or strontium hydroxide maintain a pH of about 12. Hair destruction requires about 10 minutes. Depilation is followed by careful rinsing with water, and various conditioners are applied to restore the skin's pH to normal. Depilation does not destroy the dermal papilla, and the hair grows back. Chemical depilatories are available in gel, cream, lotion, aerosol, roll-on, and powder forms. Common brands include Nair, Magic Shave, and Veet. Chemical depilatories are indicated in the treatment of hirsutism in polycystic ovary syndrome. Hair removal, also known as epilation or depilation, is the deliberate removal of body hair or head hair.<sup>[5]</sup>

**Chemistry:** A chemical depilatory is a cosmetic preparation used to remove hair from the skin. Common active ingredients are salts of thioglycolic acid and thiolactic acids. These compounds break the disulfide bonds in keratin and also hydrolyze the hair so that it is easily removed. Formerly, sulfides such as strontium sulfide were used, but due to their unpleasant odor, they have been replaced by thiols. The main chemical reaction effected by the thioglycolate is:

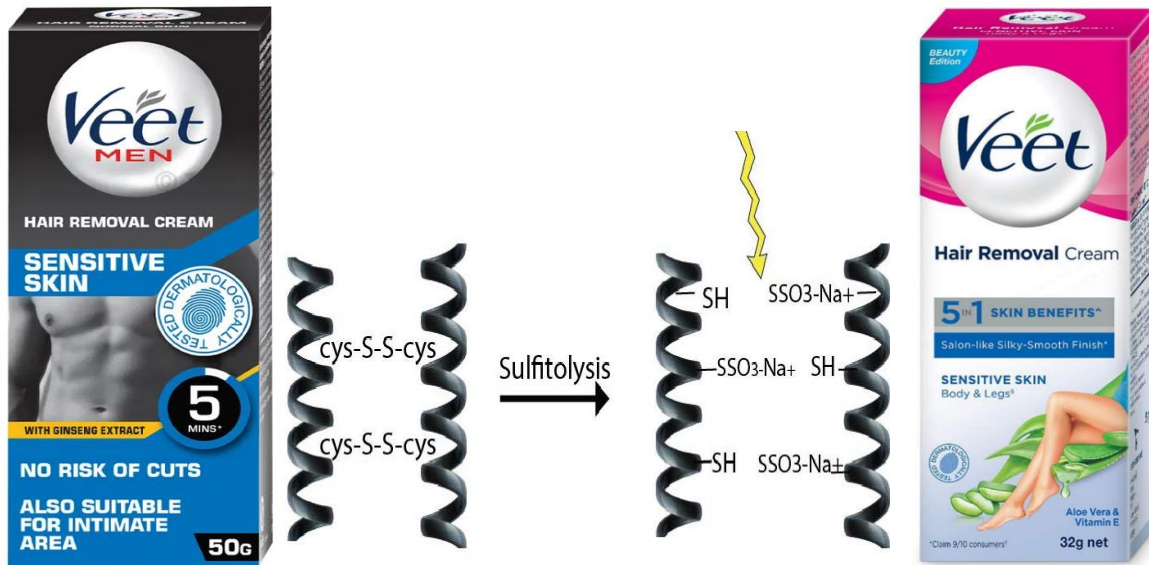


Figure-2: Keratin layer breakdown by depilatory action.

Hair typically grows all over the human body and can vary in thickness and length across human populations. Hair becomes more visible during and after puberty and men tend to have thicker, more visible body hair than women. Both males and females have visible body hair on the head, eyebrows, eyelashes, armpits, genital area,

arms, and legs. Males and some females may also have thicker hair growth on their face, abdomen, back, buttocks, anus, areola, chest, nostrils, and ears. Hair does not generally grow on the lips, back of the ear, the underside of the hands or feet, or on certain areas of the genitalia.

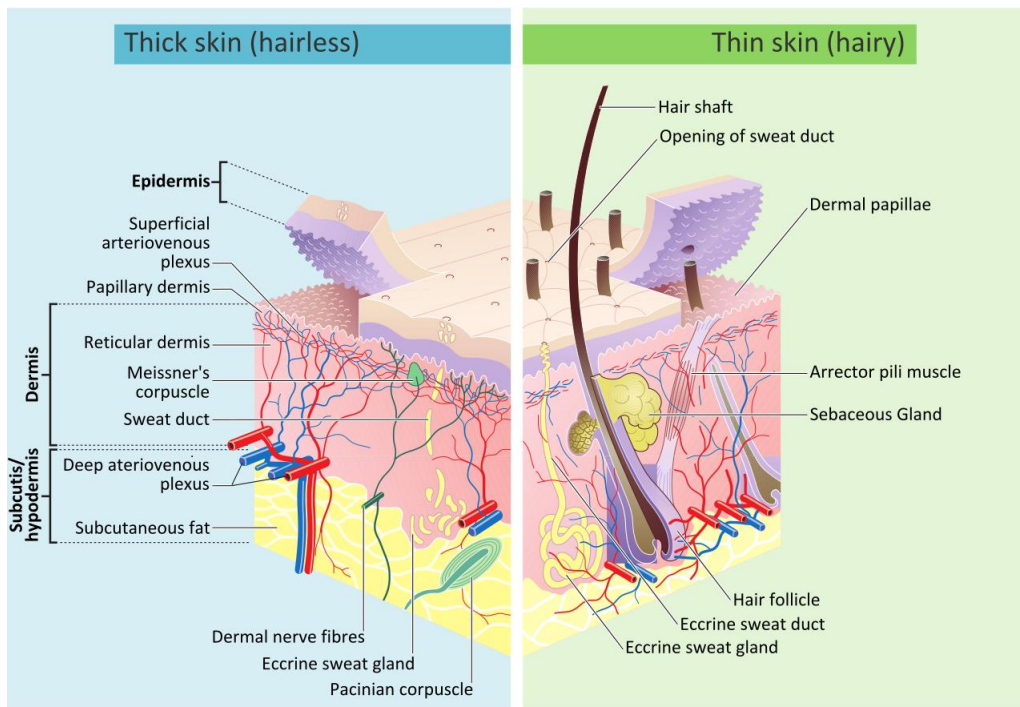


Figure-3: Anatomy of hairless & hairy skin.

Hair removal may be practiced for cultural, aesthetic, hygienic, sexual, medical, or religious reasons. Forms of hair removal have been practiced in almost all human cultures since at least the Neolithic era. The methods used to remove hair have varied in different times and regions.<sup>[6]</sup>

**Market preparation**

- Veet Fresh Hair Removal Cream.
- Bombae Shea Butter Hair Removal Cream.
- Namyaa Hair Removal Cream.
- Sanfe Painless Sensitive Hair Removal Cream.
- Evertreen Natural Hair Removal Cream.



Figure-4: Different types of depilatories.

#### Different types of hair removal

1. Shaving: For both sex: Before you shave, wet your skin and hair to soften it. Next, apply a shaving cream or gel. Shave in the direction that the hair grows. Rinse after each swipe of the razor. Store your razor in a dry area. Men who have acne should take special care while shaving.
2. Hair removal cream: When the chemicals sit on your hair, it attacks and breaks the hair. Chemicals like calcium hydroxide and potassium hydroxide present in the hair removal creams also irritate or darken the skin. Those who have sensitive skin may experience unpleasant sensations for a very long time and could end up developing a rash.
3. Epilation: Unlike waxing and tweezing, epilation hair removal goes beyond the surface of the skin to the root of the hair follicle. Rather than stripping the skin of its nutrients along with the hair – the unfortunate result of methods such as waxing – epilation protects the skin cells by removing the hair at the root.
4. IPL: Intense Pulsed Light technology. Home IPL hair removal devices apply very gentle pulses of light to the hair root. This makes the hair go into its resting phase: the hair you have falls out, and gradually your body grows less hair in that area. That smoothness lasts a long time, too.
5. Electrolysis: It is a method of removing individual hairs from the face or body. Today's medical electrolysis devices destroy the growth center of the hair with chemical or heat energy. After a very fine probe is inserted into the hair follicle, the hair is removed with tweezers.
6. Laser hair removal: Laser hair removal is a medical procedure that uses a concentrated beam of light (laser) to remove unwanted hair.
7. During laser hair removal, a laser emits a light that is absorbed by the pigment (melanin) in the hair. The light energy is converted to heat, which damages the tube-shaped sacs within the skin (hair follicles) that produce hairs. This damage inhibits or delays future hair growth. Although laser hair removal effectively delays hair growth for long periods, it usually doesn't result in permanent hair removal. Multiple laser hair removal treatments are needed for initial hair removal, and maintenance treatments might be needed as well. Laser hair removal is most effective for people who have light skin and dark hair, but it can be successfully used on all skin types.

8. Medications: Eflornithine is a skin cream that reduces unwanted facial hair among women or people assigned female at birth. The brand name of this medication is Vaniqa®. You can apply this medication to your affected skin as directed, twice per day, at least 8 hours apart.
9. Choosing: There are many ways to remove hair from the body, including shaving, epilation, IPL, and electrolysis. Choosing the right method depends on a variety of factors. These include the location of the hair on the body, a person's skin tone, and how long they would like the results to last.
10. Tweezers: A small piece of equipment made of two narrow strips of metal joined at one end. It is used to pull out hairs or to pick up small objects by pressing the two strips of metal together with the fingers: a pair of tweezers.



Figure-5: Depilatory cream for both sex.

**Advantages and disadvantages:** There are several disadvantages to many of these hair removal methods. Hair removal can cause issues: skin inflammation, minor burns, lesions, scarring, ingrown hairs, bumps, and infected hair follicles. Some removal methods are not permanent, can cause medical problems and permanent damage, or have very high costs. Some of these methods are still in the testing phase and have not been clinically proven. One issue that can be considered an advantage or a disadvantage depending upon an individual's viewpoint, is that removing hair has the effect of removing information about the individual's hair growth patterns due to genetic predisposition, illness, androgen levels (such as from pubertal hormonal imbalances or drug side effects), and/or gender status. In the hair follicle, stem cells reside in a discrete microenvironment

called the bulge, located at the base of the part of the follicle that is established during morphogenesis but does not degenerate during the hair cycle. The bulge contains multipotent stem cells that can be recruited during wound healing to help repair the epidermis. In addition to preventing body odor, hair removal can also improve skin health. By removing hair, you're essentially giving germs and bacteria fewer places to hide, which can go a long way in keeping your skin healthy and clean. Plus, hair removal can help reduce ingrown hairs, which can be painful and unsightly. Removing pubic hair by waxing or shaving can cause skin irritation, razor burns, or ingrown hairs, which can be uncomfortable or painful. Infection: Shaving or waxing can create small cuts or openings in the skin that can increase the risk of infection, especially if the area is not kept clean.

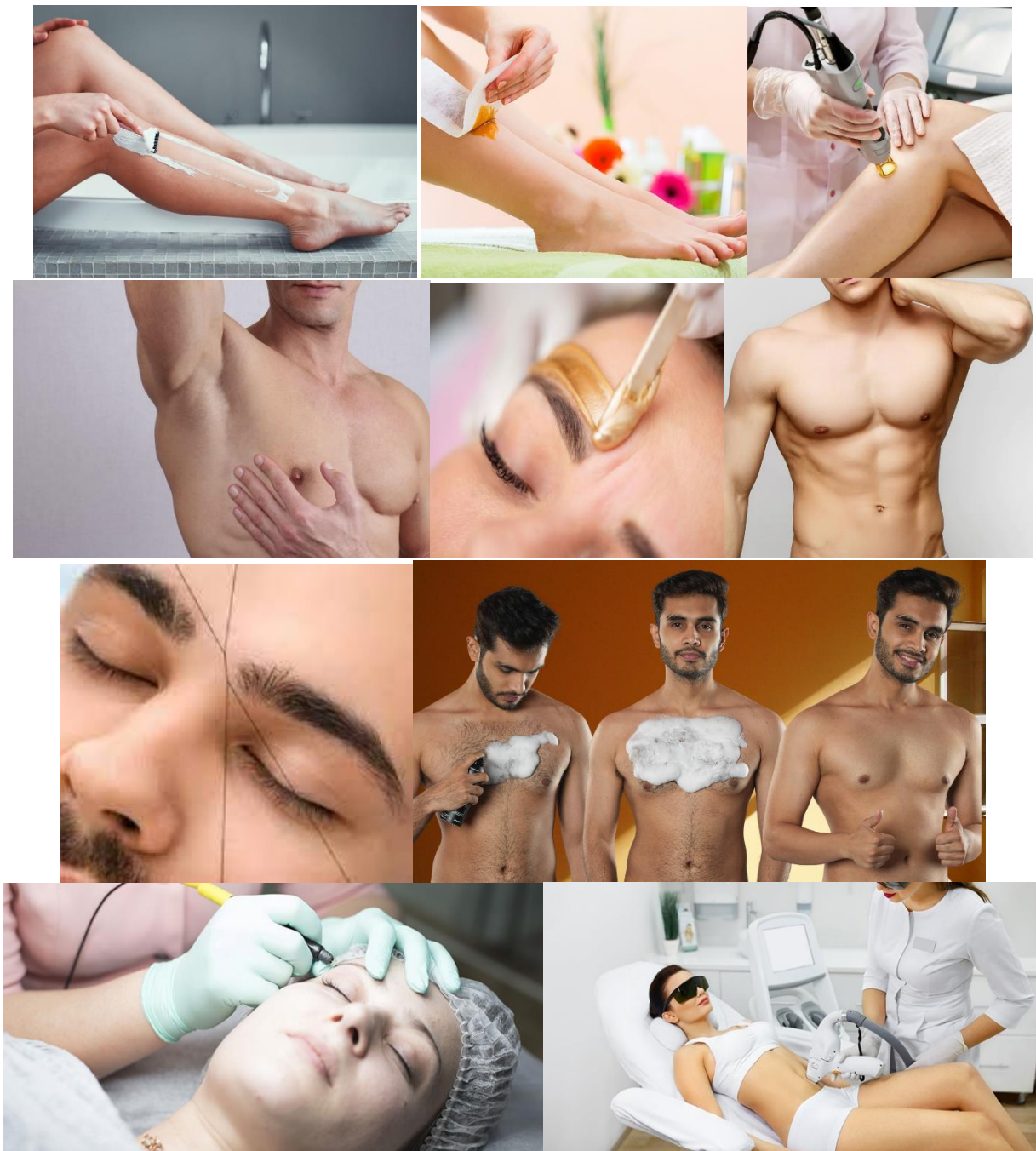


Figure-6: 10 Different hair removal devices of men & women.

**Conclusion:** When it comes to removing unwanted hair, you have options. With so much misinformation available about these options, it can be difficult to know which one(s) is best for you. To help you make an informed decision, here are the basic facts that dermatologists share with their patients about 7 popular ways to remove unwanted hair.

**Shaving:** When you shave, the razor cuts the hairs at the surface of your skin so that you cannot see the hairs.

**Fast facts:** Here are the long and short of shaving: You can shave any area of the body. You can quickly learn

how to shave. Shaving is painless (unless you cut yourself), unlike waxing or laser hair removal. The results are short-lived, so you may need to shave daily or every few days to maintain your results. Frequent shaving can irritate your skin. Injuries, such as cuts, nicks, and razor burns, happen. Some people who shave develop ingrown hairs. How to get the best results: The following tips from dermatologists can help you reduce injuries and get a close, comfortable shave. How to shave: For men and women - Discover 6 simple steps that can help you get a clean, comfortable shave and minimize irritated skin. How to shave your face - Men, using the right technique can go a long way toward

getting soft, smooth, and hairless skin. 7 ways to prevent injuries while trimming pubic hair - Find research-proven ways to reduce these all-too-common injuries.

**Waxing:** You apply wax (hot or cold) to your skin and then quickly remove it, which pulls out the hairs.

**Fast facts:** Here are the cold facts about this option: The results can last a few weeks or longer. You can wax any area of your body, including large areas, such as your legs, and delicate areas, such as the skin above your upper lip. Waxing takes practice to learn. Removing the wax can be painful. Your newly waxed skin can be red and irritated for a short while after you wax. If the wax is too hot, it can burn your skin. How to get the best results: These dermatologists' tips can help you keep it safe and effective.

Waxing is not recommended if you are currently: Taking isotretinoin (a prescription medication approved to treat severe acne) or have taken it within the past 6 months. Using an antibiotic. Applying tretinoin (also known as retinoic acid) to your skin. These medications thin your skin. When the wax is removed, your skin could tear. If you wax at home, be sure to see what dermatologists recommend. How to wax. If you go to a salon for a wax, make sure the estheticians: Use wooden sticks rather than a metal spatula to apply the hot wax. Dip an unused wooden stick into the wax each time they apply wax to your skin. Dipping the stick into the wax more than once is called double dipping. This unsanitary practice can transfer bacteria and other germs from previous clients to you. Heated wax is not hot enough to kill bacteria and other germs.

**Depilatories:** You apply a cream, lotion, or gel to the skin, which can dissolve unwanted hair.

**Fast facts:** The following can help wash away any misconceptions about using a depilatory: The results tend to last longer than when you shave. It's quick and easy to use at home. You simply apply, wait, and rinse off the product at the time stated in the instructions. These products can irritate your skin, so dermatologists recommend that you test them. Some people can use a product for months or years before it starts to irritate their skin. Some people dislike the odor of these products. How to get the best results from a depilatory: Always, test first. Before using a depilatory for the first time or using it on a different part of your body, here's how to test the product: Apply a small amount to an area on which you want to use it. Keep it on your skin for the time stated in the instructions (or until your skin starts to burn or sting). Rinse it off immediately and thoroughly at the time stated or at the first sign of burning or stinging. If you experience burning or stinging, don't use the

product. Find another depilatory to test. If within 24 hours of applying the product you don't have a skin reaction, you can use the product in that area.

How to remove unwanted hair using a cream, lotion, or gel. When it comes to hair removal, there are options besides shaving or waxing. According to board-certified dermatologists from the American Academy of Dermatology, people can dissolve unwanted hair using products called depilatories. These are creams, lotions, and gels that are applied to the skin, and the results can last longer than shaving. To use a hair-removal cream, lotion, or gel, follow these tips from board-certified dermatologists.

**Threading:** This option involves rolling two twisted cotton threads over the unwanted hairs, which rips them out.

**Fast facts:** To help you thread your way through the pros and cons of this option, here are the key facts: Since threading removes only the unwanted hair, it's an option for areas, such as your eyebrows, where you want to keep some hair. It's as precise as plucking but much faster. You can remove many hairs at once. The results can last 4 to 5 weeks. It causes little irritation, so it's an option for sensitive or acne-prone skin. Threading is not suitable for large areas. How to get the best results: Ask people you trust for salon referrals. Threading takes time to learn. In inexperienced hands, it can cause your eyebrows to look uneven or even cause ingrown hairs.

**Prescription cream:** Women apply this cream to the areas on their face where they want less hair. The active ingredient, eflornithine hydrochloride [(RS)-2,5-Diamino-2-(difluoromethyl)pentanoic acid], helps prevent new hair from growing. You may see this medication advertised as Vaniqa® or Eflora®.

**Fast facts:** If this option sounds appealing, here's what you should know: This medication can slow hair growth so that you have less hair in the treated areas, usually within 4 to 8 weeks. You need a prescription for this medication, so you'll need to see a doctor, such as a board-certified dermatologist, who has experience treating patients with this medication. The cream cannot remove existing hair, so you need to remove the unwanted hair in that area and any stray hairs that grow. You need to apply this medication twice a day for as long as you want to see results. Once you stop applying the medication, your hair will regrow. Like all medications, this one has possible side effects.

How to get the best results: If this option appeals to you, see a board-certified dermatologist who has experience treating patients with this medication. This is not a hair

removal option for everyone. Your dermatologist can tell you if you're a good candidate.

**Laser hair removal:** The laser emits a beam of light, which the pigment (color) in your hair absorbs. Over time, this can destroy the hair follicle, so the hair cannot grow back. While it takes about 6 treatments from a dermatologist to destroy a follicle, the hair will grow back thinner and finer after each treatment. If you use at-home laser hair removal, you will need to use the device for a lot longer to see results. You'll also need to use it periodically to maintain results.

**Fast facts:** The following can help shed light on whether this may be an option for you: It can take 6 treatments more, but laser hair removal is permanent, except for on a woman's face. People of all skin colors can safely have laser hair removal, but the person performing the procedure on people who have skin of color should have experience performing laser hair removal on darker skin tones. There's no downtime. Men who have constant razor burn or ingrown hairs due to shaving can permanently eliminate their beard with laser hair removal. Once you're no longer shaving, you won't be bothered by razor burn or ingrown hairs. Laser hair removal won't work on blonde, white, gray, or red hair because lasers cannot effectively target light-colored hair. You'll need to keep the treated area covered and out of the sun until the skin heals. If you have a tan, you must wait for the tan to fade completely before it's safe to have laser hair removal.

How to get the best results: Your results depend largely on the experience and knowledge of the person performing your procedure, so it's essential to: Have an experienced doctor perform laser hair removal. While laser hair removal may look easy to perform, it can injure your skin if the person performing your treatment is inexperienced. Possible injuries include burns, blisters, infection, or dark spots. Find out if this is a safe and effective option for you. A board-certified dermatologist can tell you if you're a good candidate for laser hair removal. Not everyone is. See your dermatologist before using an at-home laser. These at-home devices are not for everyone. There are many at-home devices from which to choose, so it can be difficult to know which one to buy.

**Electrolysis:** This method sends an electrical current through a hair follicle, which will damage the follicle and prevent hair from growing. Because hair grows in cycles, it takes several sessions to get permanent hair removal. You'll also find kits that allow you to perform electrolysis at home. Unlike professional electrolysis, kits don't involve inserting probes into your hair follicles.

**Fast facts:** If this sounds appealing, you may find the following facts electrifying: Electrolysis can permanently remove unwanted hair. Once your hair is gone, you won't need maintenance treatments. It works on all hair types, including light-colored hairs, which lasers cannot remove. There's no downtime. If your operator uses unsterile probes, it can cause a skin or blood infection. In inexperienced hands, electrolysis can cause scarring and burns. People with darker skin can develop a type of raised scar called a keloid. Some people say electrolysis feels uncomfortable or painful because each time a hair is treated, you feel a stinging sensation.

## REFERENCES

1. Aldraibi MS, Touma DJ, Khachemoune A "Hair removal with the 3-msec alexandrite laser in patients with skin types IV-VI: efficacy, safety, and the role of topical corticosteroids in preventing side effects". *Journal of Drugs in Dermatology*, 2007; 6(1): 60–66.
2. Alexiades-Armenakas M. "Laser hair removal". *Journal of Drugs in Dermatology*, 2006; 5(7): 678–679.
3. Eremia S, Li CY, Umar SH, Newman N. "Laser hair removal: long-term results with a 755 nm alexandrite laser". *Dermatologic Surgery*, 2001; 27(11): 920–924.
4. McDaniel DH, Lord J, Ash K, Newman J, Zukowski M. "Laser hair removal: a review and report on the use of the long-pulsed alexandrite laser for hair reduction of the upper lip, leg, back, and bikini region". *Dermatologic Surgery*, 1999; 25(6): 425–430.
5. Wanner M. "Laser hair removal". *Dermatologic Therapy*, 2005; 18(3): 209–216.
6. Warner J, Weiner M, Gutowski KA "Laser hair removal". *Clinical Obstetrics and Gynecology*, 2006; 49(2): 389–400.