

# Best Practice Options for Hair Removal in Patients with Unwanted Facial Hair Using Combination Therapy with Laser: Guidelines Drawn up by an Expert Working Group

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## Key Words

Unwanted facial hair · Hirsutism · Hair removal · Laser · Eflornithine

## Abstract

Hirsutism is a common disorder affecting between 5 and 15% of the population. One of the most devastating consequences of hirsutism is the presence of unwanted facial hair. Treatment of hirsutism involves a two-pronged approach: treating the underlying cause and reduction of visible hair. Laser hair removal is one of the most effective options for reducing visible hair, however, it may not be wholly effective in all patients and combination therapy may need to be considered. Pharmacological therapy is often used in combination with mechanical hair removal due to the time needed for the drug treatment to demonstrate visible results. Clinical data investigating the use of laser treatment in combination with other treatments has focused on laser with topical eflornithine. The expert working group reviews existing data and provides guidance on the use of eflornithine in combination with laser for resistant hirsutism.

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## Introduction

Hirsutism is typically defined as an androgen-dependent, male pattern of hair distribution in women [1]. This condition is distinct from hypertrichosis, which is androgen-independent growth of vellus body hair in non-sexual areas [2]. Hirsutism is a common disorder that is estimated to affect between 5 and 15% of women of reproductive age in the general population [3]. It is a distressing condition that can be associated with increased anxiety, depression, self-consciousness and embarrassment, diminished self-confidence and body dissatisfaction [4, 5]. As many as 60% of hirsute women believe that hair growth has an impact on the way they perceive themselves [5], whilst 68% avoid social situations [6]. Over a quarter of hirsute patients have psychiatric disturbances [7].

For most women, one of the most devastating consequences of hirsutism is the presence of unwanted facial hair (UFH) as this is always visible to others. Indeed, clinical experience shows that women with hirsutism generally only seek medical help if they experience facial hirsutism [8]. It is believed that over 40% of women in the

general population have some degree of UFH [9]. This paper focuses on the best practice options for hair removal in patients with hirsutism, including facial hirsutism, especially laser hair removal and its treatment options in combination therapy.

Clinical evaluation of hirsutism generally relies on the observer's assessment of whether or not the woman demonstrates a male-like pattern of body hair growth [3]. The most common visual method of scoring the extent of body and facial terminal hair growth is the modified Ferriman-Gallwey scale [10]. It is important to note that there is not always a correlation between the physician's and the patient's assessment of her hirsutism and that the patient's assessment might be of even greater importance than the physician's assessment.

### **Causes of Hirsutism**

Hirsutism, with few exceptions (e.g. iatrogenic drug-induced hirsutism), is either a sign of an underlying hormonal disorder, such as hyperandrogenism, or it appears without any cause, which is known as idiopathic hirsutism [3]. The most common cause of androgen excess is polycystic ovary syndrome (PCOS), with non-classic adrenal hyperplasia (CAH), hyperandrogenic insulin-resistant acanthosis nigricans syndrome, androgen-secreting tumors and androgenic drug intake being important but less frequent causes [3]. Hirsutism is seen in 75% of patients diagnosed with PCOS [11], where the development of UFH is typically gradual in onset [12]. The prevalence of PCOS in women of reproductive age is estimated to be 6.6% [11]. UFH may develop or worsen during the menopause because of a change in hormone balance [13]. The change in hormone levels and the effect of these on hair growth are most pronounced in postmenopausal women, who tend to present almost exclusively with facial hirsutism [14].

Hirsutism results from increased androgen stimulation of hair follicles, either from increased circulating levels of androgens (endogenous or exogenous) or due to increased sensitivity of hair follicles to normal levels of circulating androgens [15]. It should be remembered, however, that not all forms of hirsutism are androgen-dependent and that the androgen-independent form can be inherited as a familial trait. Several drugs, including cyclosporin, diazoxide, glucocorticoids and minoxidil, can cause hirsutism [16].

### **Treatment of Hirsutism**

Treatment of hirsutism involves a two-pronged approach: treating the underlying cause and reduction of visible hair. Reduction of androgenic stimulation can be achieved through pharmacological therapy or surgery whilst removal of terminal hair is usually accomplished by physical (mechanical, electrical or light-assisted) and pharmacological methods.

### **Causal Treatment**

Causal treatments are those that treat the underlying cause of hirsutism rather than the symptoms. This includes pharmacological treatment and surgical treatment. The aim of pharmacological treatment of hirsutism is to rectify any causal hormonal imbalance and consequently improve the aesthetic appearance of hirsutism, thereby positively affecting the patient's quality of life [17]. Treatment consists of reducing circulating androgen levels by suppressing ovarian or adrenal androgen secretion. For women with idiopathic hirsutism, PCOS or late-onset CAH, appropriate treatment strategies depend on each patient's wishes and whether they are planning to have children [18]. Treatment in this group is most commonly achieved with antiandrogens and/or oral contraceptives (OCs) [3]. OCs have the dual advantage of suppressing ovarian androgen production and offering secure and adequate contraception, which is essential for patients prescribed antiandrogens.

It is also possible to reduce effective circulating androgen levels and thereby to reduce their action at the hair follicle through the use of  $5\alpha$ -reductase inhibitors such as finasteride, which decreases the amount of  $5\alpha$ -dihydrotestosterone, the most active form of androgen. This approach has not, however, become mainstream owing to variable efficacy and the side effect profile [17]. The use of androgen blockers has been reported but is not widely accepted [3]. Commonly used antiandrogens are spironolactone and flutamide [18]. All antiandrogens are potentially teratogenic and so are only prescribed for women using reliable contraception [19]. Antiandrogens may be combined with OCs for the treatment of hirsutism [18]. Antiandrogens provide a favorable treatment choice in postmenopausal women [20], although response to treatment is slow and it may take up to 18 months for an effect to be seen [18]. Generally treatment decisions for patients approaching the menopause are made on the basis of clinical experience [19].

## Reduction of Visible Hair

### *Physicomechanical Options*

Reduction of unwanted visible hair can be achieved by a variety of means. Many mechanical and chemical options for hair removal are chosen as methods of self-treatment. Physicomechanical hair removal techniques include tweezing, depilatories, waxing, shaving and electrical depilation [12]. Shaving is the easiest and the safest option for patients affected by mild hirsutism, however, it is often psychologically unacceptable to patients with prominent UFH [18]. Chemical depilatories produce similar results to shaving, but skin irritation may be a common side effect [18]. Electrolysis-assisted epilation is a more tedious and time-consuming method that has now been largely supplanted by the use of laser and light-assisted techniques [18]. Best results are achieved with a combined approach using both mechanical hair removal and pharmacological therapy [16].

### *Laser Hair Removal*

Lasers and noncoherent light sources have been introduced to cause damage to hair follicles, on the basis of the principles of selective photothermolysis [21]. For selective thermal damage of a pigmented target structure to be achieved, sufficient fluence at a wavelength preferentially absorbed by the target must be delivered for a time that is equal to or less than the thermal relaxation time of the target [21].

Melanin is the natural chromophore for optical targeting of hair follicles. Red or near-infrared wavelengths (694-nm ruby laser, 755-nm alexandrite laser, 800-nm diode laser, 1,064-nm Nd:YAG laser and various intense noncoherent light sources) are in an optical window of the spectrum where selective absorption by melanin is combined with deep penetration into the dermis [22]. Deep, selective heating of the hair shaft, hair follicle epithelium and the heavily pigmented matrix is therefore possible in the 600- to 1,100-nm region. However, melanin in the epidermis presents a competing site for absorption. Cooling of the epidermis before and during laser exposure has been shown to minimize epidermal injury.

### *Light-Based Devices*

Light-based devices used for hair removal may be grouped into three categories, according to their wavelengths: (i) red light systems (694-nm ruby); (ii) infrared light systems (755-nm alexandrite, 800-nm semiconductor diode, or 1,064-nm neodymium:yttrium-aluminium

garnet, Nd:YAG); (iii) intense pulsed light (IPL) sources (590–1,200 nm) [23].

Ruby lasers produce a laser beam of 694 nm using a xenon flash lamp to excite a ruby crystal in free running mode for hair removal [23]. High melanin absorption is seen at 694 nm, therefore, ruby lasers are best indicated in light-skinned (Fitzpatrick skin types I–III) individuals with dark hair [24].

Long-pulsed alexandrite lasers have a wavelength of 755 nm. The advantage of this longer wavelength is lower melanin absorption compared with the ruby laser, suggesting that epidermal damage may be less in patients with darker skin [23]. Further, the ratio of energy deposited in the dermis to that in the epidermis is greater because of a greater depth of penetration [24]. The risk for epidermal damage in persons with darker skin is therefore reduced in comparison with ruby laser treatment [24].

In diode lasers, energy is emitted by multiple arrays of semiconductor diodes to provide a laser light of approximately 800 nm [23]. Long-term results suggest diode lasers are very effective for the removal of dark, terminal hair [24].

The Nd:YAG laser system utilizes a longer wavelength (1,064 nm) than the ruby laser, which allows better penetration into the skin [23]. In comparison with the ruby laser, this wavelength is also less likely to be absorbed by epidermal melanin and is therefore useful for darker skin types, potentially diminishing the incidence of side effects in this population [23]. Data from clinical studies have demonstrated less hair reduction with the Nd:YAG than with the ruby laser or alexandrite lasers [23].

A Q-switched Nd:YAG laser, with or without the addition of an external chromophore, has been shown to induce only a temporary hair removal effect because the pulse duration (nanosecond) is too short to damage a hair follicle sufficiently.

An IPL source is not strictly a laser system as it delivers broad-spectrum, noncoherent pulsed radiation of different spectral bands according to the optical filters selected to shrink the original xenon lamp emission, which spans from 500 to 1,200 nm. Spectral bands selected for permanent hair reduction are usually limited from 550 to 950 nm [23]. Specific light parameters (spectral band, wavelength, number of pulses, pulse duration, interpulse delay and fluency) are selected by the operator according to the patient's skin type and hair color [23].

### *Efficacy of Laser Treatment*

Substantial evidence exists for a partial short-term hair reduction efficacy of up to 6 months after ruby laser, alex-

alexandrite laser, diode laser, Nd:YAG laser and IPL [25]. A review of 11 randomized controlled trials demonstrated that a short-term effect of approximately 50% hair reduction with alexandrite and diode lasers lasts up to 6 months after treatment [26]. Long-term hair removal efficacy (beyond 6 months) is seen for all lasers after repetitive treatments: two to four treatments for both the alexandrite and diode lasers, three to four treatments with the ruby laser and five treatments with long-pulsed Nd:YAG [25]. The best long-term hair reduction was reported for the alexandrite and diode lasers after four repetitive axillary treatments with 84–85% hair reduction 12 months post-operatively (maximum tolerated fluences) [25]. Long-term hair reduction of 74–84% at 18 months has been seen with the alexandrite and Nd:YAG lasers [27].

The long-term effects of lasers on the severity of facial hirsutism and on psychological morbidity in women with PCOS have been investigated in a randomized trial. Laser treatment appeared to reduce the severity of facial hair and time spent on hair removal as well as alleviating depression and anxiety in women with PCOS [28]. Inappropriate selection of light parameters and occasionally unpredictable patient response may nevertheless induce paradoxical hair growth on treated skin areas. Therefore, this treatment must be applied with caution [29].

A variety of factors may influence the final outcome of light-assisted hair reduction. They include physical and technical characteristics of the system used (i.e. wavelength, fluency, spot size, pulse duration, skin cooling and photothermal effect on the hair bulb) and individual characteristics of skin and hair pertinent to patients being treated (i.e. anatomical region, skin pigmentation, hair color, hair thickness, hair growth cycle and depth of follicles) [25].

In general, light-assisted hair reduction is most successful in fair-skinned patients (Fitzpatrick skin types I–IV) who have dark hair [23]. However, patients with darker skin types (Fitzpatrick V and VI) can also be effectively treated with longer wavelengths, for example diode or Nd:YAG lasers that operate in combination with a cooling system [24]. Fair and vellus hair is relatively resistant to removal by laser because of the absence or paucity of melanin [30]. In all cases, repeated treatments are necessary and permanent hair removal is unlikely to be achieved. Due to the risk of eye damage, treatment near the surface of the eye is not recommended. Thus, in both cases pharmacotherapy should be the preferred option to achieve better results and to prevent eye injuries.

Adverse events following laser hair removal tend to be infrequent and include pain, erythema and pigmentary

changes [26]. Immediately after laser-assisted hair removal most patients experience erythema and edema lasting up to 48 h [23]. Temporary hyperpigmentation occurs in 14–25% of patients and hypopigmentation occurs in 10–17% [23]. A higher incidence of pigmentary alterations is associated with the shorter wavelength lasers and with shorter pulse durations [31]. Serious eye injury can occur after laser epilation of eyebrows [32, 33].

#### *Pharmacological Options to Reduce Unwanted Hair Symptomatically: Topical Eflornithine*

Although systemic hormonal therapy typically targets androgenic causes of hirsutism, it may also help to reduce unwanted hair even when androgen levels are within the normal range.

UFH can be managed with topical eflornithine cream, which is licensed for use in the treatment of hirsutism specifically on the face [8]. It is an irreversible inhibitor of L-ornithine decarboxylase, an enzyme that catalyses the conversion of ornithine to putrescine (a polyamine that is critical to the regulation of cell growth and differentiation) [12]. This inhibition of the rate-controlling step in the production of putrescine in active hair follicle cells slows the rate of hair growth and makes hair less visible and less coarse [12].

Statistically significant reductions in hair growth rate have been seen after 8 weeks of treatment with eflornithine versus placebo, and these effects were maintained for up to 12 months of continuous therapy [4, 34, 35]. Eflornithine has been shown to slow facial hair growth in up to 70% of patients treated, significantly improving and reducing the psychological burden of facial hirsutism [4, 34, 35].

Eflornithine cream has a favorable dermal safety profile, as appropriate for a topical treatment that is to be applied for a relatively long time [36]. Results of a repeated insult patch test, a phototoxicity study and a photocontact allergy study demonstrated that eflornithine cream does not have contact sensitizing, photocontact allergic or phototoxic properties, but can potentially cause irritation under exaggerated conditions of use [36]. The low degree of percutaneous absorption and a low systemic exposure to eflornithine further demonstrate the favorable clinical safety profile of eflornithine [37].

Safety data are available for over 1,350 patients treated with eflornithine for 6–12 months. Skin-related adverse reactions reported during clinical studies of eflornithine were mostly mild in intensity and resolved without discontinuing treatment with eflornithine and/or initiating medical treatment [34, 35]. Most adverse skin reactions

occurred at a similar rate in the eflornithine and placebo groups apart from burning, stinging, tingling, rash and erythema: these reactions were reported more frequently in the eflornithine treatment group compared with the placebo treatment group [35]. In these and other studies, a mild acne-like eruption is the most frequently reported adverse event and this is generally of mild intensity [35]. However, there is no worsening of preexisting acne in patients treated with either eflornithine or placebo and there is no difference in the development of new-onset acne. In the vehicle-controlled trials (n = 594), acne was observed in 41% of patients at baseline; 7% of patients treated with eflornithine and 8% treated with vehicle experienced a worsening of their condition [35]. Of those with no acne at baseline, similar percentages (14%) reported acne following treatment with eflornithine or vehicle [35].

### **Options for Combination Therapy with Light Sources**

The use of combined techniques in the management of hirsutism is not a new concept. Pharmacological therapy is often used in combination with mechanical hair removal due to the length of time needed for the drug treatment to achieve the expected clinical results. It is recommended that all patients suffering from hirsutism should be offered OC therapy as well as mechanical treatments [38]. Some medical treatments are prescribed with other drug treatments, for example the addition of anti-androgens to OCs as the OC acts as an important safety measure [38].

Light-assisted hair reduction is a well-established and effective treatment for the management of hirsutism, however, it is not without limitations. Therefore, to enhance the benefits of laser treatment it is worth considering combining therapies with synergistic modes of action that may enhance the benefits for the patients. Among the many potential options for combining pharmacological treatment with physicommechanical options, only the safety and efficacy of the combination of laser with eflornithine cream has been established at an evidence-based level. Recommendations of this expert working group include the combined use of laser with shaving, hormone therapy and eflornithine cream. Shaving is frequently recommended prior to laser hair removal as it prevents the laser beam from heating the hair on the skin, which would otherwise result in burnt hair damage to the skin and reduce the energy delivered to the hair follicle. In

PCOS patients, laser therapy is recommended to be used as the patient commences hormone therapy because the benefits from hormone therapy may not be realized before 6 months. The combined use of laser with eflornithine cream is recommended for patients to achieve faster and better results, or for patients with light hair on dark skin, and it can be used in all areas including those where laser is not suitable, especially near the eyes.

As the aim of this article is to review clinical data on combination therapy for the management of hirsutism, we will largely focus on the combination of laser with eflornithine cream. However, it should be noted that the potential for combination therapy is vast and more clinical trials are needed to further explore this area.

As eflornithine and light-based treatment are able to decrease hair growth through different mechanisms, it has been hypothesized that the combination of the two techniques would lead to greater and more rapid reduction of unwanted hair. Current treatment options of using laser treatment or topical eflornithine alone are sometimes inadequate in poorly responding patients [39] whereas a combination approach may be potentially more effective. Eflornithine cream, in combination with light-assisted therapy, may also be effective in treating unwanted hair that is unresponsive to laser therapy alone, such as fair or vellus hair [40].

### *Overview of Clinical Trials*

The safety and efficacy of light-assisted hair reduction in combination with eflornithine to treat UFH has been demonstrated in two randomized, double-blind, placebo-controlled, right-left comparison studies [30, 41].

The first study by Smith et al. [41] was designed to assess the efficacy and safety of eflornithine versus placebo combined with laser therapy in the treatment of UFH in women. 54 women with Fitzpatrick skin types I–IV who had predominantly brown/black terminal hair were enrolled. Patients were randomized to treatment with eflornithine on one side of the face and placebo on the other side for up to 34 weeks. Laser treatment with 1,064-nm long-pulsed Nd:YAG or alexandrite laser was performed at weeks 2 and 10. From weeks 6 through 22, eflornithine-treated sides showed a more significant reduction in hair growth. By week 34, no significant differences in hair growth were seen between the groups. The subjects' evaluation of response showed statistically significant differences favoring eflornithine cream over vehicle at all follow-up visits for both lip and chin regions. At each follow-up visit beginning at week 2, approximately 3 of every 4 subjects confirmed their preference for the eflornithine-

treated sides of the chin and lip. It can be concluded from the results of this study that hair regrowth between the two laser sessions was significantly reduced by the use of topical eflornithine; thus this combination may lead to greater patient satisfaction.

The second study, by Hamzavi et al. [30], was designed to determine whether topical eflornithine was able to enhance the efficacy of laser hair reduction in the treatment of UFH. In this study (n = 31), laser treatment with an alexandrite laser was performed at 4-week intervals for up to 6 sessions. Treatment with eflornithine or placebo twice daily was started 3 days after the first laser session and continued during the study period, stopping 3 days before each laser treatment and then starting again 3 days later. Clinical difference in hair growth between eflornithine versus placebo was statistically significant from the third laser treatment onwards ( $p < 0.05$ ,  $p < 0.01$ ). The addition of topical eflornithine to laser treatment for up to 6 months resulted in a significantly more rapid and nearly complete reduction of facial hair. Consistent superiority was shown for combined treatment with eflornithine, with the greatest effect being observed after the fourth laser session. Statistically significant differences favoring the combination of topical treatment with laser were confirmed at the final study assessment, with approximately 75% of patients reporting a preference for combination therapy through blinded patient grading ( $p = 0.029$ , Poisson regression). Complete or almost complete hair removal was achieved in 94% of patients receiving laser plus topical eflornithine treatment compared with 68% of patients receiving laser and placebo. Subject grading showed significant and persistent hair reduction through week 34 for eflornithine-treated sides. The safety profile for combination therapy was similar to topical eflornithine alone [30].

A single-case study by Ganger and Hamzavi [39] suggested that topical eflornithine as an adjunct to 800-nm diode laser treatment may be effective in decreasing hair density and thickness of both black and gray phenotypes.

#### *Practical Guidelines for Using Eflornithine in Combination with Laser Therapy*

Patients requiring treatment for hirsutism can be classified into three main groups. The first group of patients includes those who are highly suitable for light-based therapy, for example Fitzpatrick skin types I–III with dark hair and body regions that usually provide a good response. The second group includes those patients who are less suitable for light-based therapy but can still expect some positive clinical response, for example those

with thinner, white and fair hair or ‘salt and pepper’ hair, or patients with darker skin types or with body regions that are less amenable to laser therapy. The third group consists of patients who are seeking hair reduction but are reluctant to try light-based treatment.

In the first group of patients, laser hair removal should be offered alongside advice on the risks and benefits and careful selection of laser device. These patients are likely to achieve very good results with laser treatment alone. Studies have shown that combined treatment with eflornithine cream can enhance the benefits of laser treatment. Eflornithine can be prescribed in areas not suitable for laser, for example near the eyes.

For patients less suited for light-assisted treatment, eflornithine cream in combination with proper light-based devices might increase clinical benefits since topical eflornithine works independently of skin and hair type. In fact, in patients with ‘salt and pepper’ unwanted hair, topical eflornithine may be effective on hair not responsive to light whilst light-assisted hair reduction can work on sensitive hair, providing patients with a more even, uniform response and improved appearance during the intervals between hair removal treatments.

The third group of patients for whom laser treatment is not considered suitable should be offered alternative treatments. Such alternatives include physicommechanical techniques and pharmacological treatments. The treatment decision should be made on physician’s and patient’s preference considering the advantages and disadvantages of each treatment as detailed in table 1.

As monotherapy, eflornithine is used twice daily, once in the morning and once at night as part of a daily skin care routine. It can be combined with daily cosmetics. For successful management of UFH it must be used on a continuous basis. For patients who may benefit from combined treatment of light-based therapy with eflornithine, topical eflornithine treatment can begin 2–3 days after laser hair removal is initiated. Cream should be applied twice daily to the affected area of the face and treatment can be continued until 7 days after the series of laser treatments has been completed. However, a break of up to 6 days should occur following each laser treatment, beginning 2–3 days before the scheduled laser session until 2–3 days after [43]. Supportive therapy may also help to manage visible hair. Guidance on the use of eflornithine in combination with laser therapy as recommended by the expert working group is provided in table 2.

Eflornithine does not change the quality of the hair to allow laser treatment to be more effective and safe, thus

**Table 1.** Advantages and disadvantages of common hirsutism treatments [38, 42]

Treatment	Advantages	Disadvantages
Shaving	inexpensive and effective	masculine connotations; stubble; time-consuming; frequent repetition to maintain effect; potential irritant if not properly performed
Bleaching	well suited to thin hair (e.g. moustache), which is poorly responsive to light-based treatment	can potentially cause skin irritation; bleached hairs noticeable on dark-skinned individuals
Electrolysis	durable hair reduction	time-consuming; not suitable for large areas; potential scarring if not properly performed
Plucking	well suited for removal of individual hairs	can lead to pseudofolliculitis, postinflammatory hyperpigmentation and subsequent scarring; not suitable for large areas
Waxing	simple and effective; applicable to large areas and to thick or thin hair	potential risk of pseudofolliculitis, postinflammatory hyperpigmentation and skin erosions
Chemical depilatories	at-home treatment; simple and effective; may be used in combination with shaving	may cause skin irritation
OCs	general hair reduction effect	more effective in endocrine-sensitive areas; may not achieve complete resolution of hirsutism; effective only while used; long duration to onset of action (6–12 months)
Antiandrogens	especially useful for androgenic hirsutism	side effect profile problematic; teratogenic
Eflornithine	tolerated well; can be used in conjunction with other methods; good safety profile; simple use	relatively long duration to onset of action (2–4 months); effective only while used

it can be used in combination only when laser is appropriate in the first place. It does not expand the patient group that can be treated with laser; rather it enhances the benefits for this group. Although faster results can be expected with combination therapy than with monotherapy, the use of eflornithine in combination with laser treatment does not reduce the total number of sessions needed; it may, however, lead to a longer laser-free interval.

Eflornithine limits hair growth in 70% of women; therefore, there may be some patients who do not respond to treatment. It should be stressed that compliance is essential to maintain results. If eflornithine treatment is stopped for an extended period of time, hair may regrow. Eflornithine in combination with laser treatment may not be necessary for all patients as there will be some patients who are better suited to laser monotherapy. However, due to its topical use and specific mode of action it should be considered as a combination treatment for all types of UFH and hirsutism, allowing patients to achieve maximum satisfaction and relief from their symptoms.

**Table 2.** Expert working group's guidelines on the use of topical eflornithine in combination with laser therapy

UFH currently treated with eflornithine in combination with laser therapy:

- Resistant hirsutism
- Paradoxical hypertrichosis
- Resistant hypertrichosis
- Postmenopausal hypertrichosis
- Pseudofolliculitis barbae
- Facial hirsutism resulting from PCOS

Patient groups currently treated with eflornithine in combination with laser therapy:

- Patients who wish to extend the interval between laser treatments
  - Particularly advantageous in summer when patients risk presenting with a sun-tanned face
- Patients in the final stages of treatment with laser with persistent smaller, lighter hair
  - After 4–7 procedures the patients enter a 'steady phase' where after reducing the number of hair follicles to a minimum an additional method of hair removal is needed for persistent hair
- Patients with conditions resistant to laser treatment
  - Light or vellus hair
  - Salt and pepper hair

## Conclusions

Patients with hirsutism suffer a significant emotional burden of distress and spend considerable effort trying to control their UFH [28]. UFH in particular is a significant problem. Before treatment can be initiated, any underlying disease must be excluded. Therefore, it is important to differentiate between a symptomatic therapy to relieve unwanted hair and a cause-focused therapy that might be required. Symptomatic therapy may be appropriate even when cause-focused therapy is ongoing. Among available procedures, light-assisted hair reduction is certainly one of the best-established and effective methods. Clinical benefits can be potentially enhanced by combining this physical method with a pharmacological treatment featuring a different mode of action. Potentially suitable are almost all methods and compounds presently available (table 1). Among these, topical and local approaches have the advantage of being unlikely to interfere with systemic therapies. Based on that perspective and on scientific data available, eflornithine is a good option among the nonhormonal, topical medicinal prescription products.

Topical eflornithine is the only prescription medicine with confirmed beneficial effects in combination with laser hair removal in randomized, double-blinded and placebo-controlled studies. The expert working group recommends the use of eflornithine in combination with laser for resistant hirsutism, paradoxical hypertrichosis, resistant hypertrichosis, postmenopausal hypertrichosis, pseudofolliculitis barbae and patients with PCOS experiencing hirsutism. Combined treatment is especially suitable for patients who wish to come to treatment less often, patients in the final stages of treatment with laser with persistent smaller, lighter hair and patients with conditions resistant to laser treatment. However, further investigations would help to understand the longer-term benefits of this combination therapy.

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