
Hair Removal Using the Elora™, an Innovative, Intense Pulsed Light (IPL™) System

INTRODUCTION

Removal of unwanted hair is one of the most commonly sought cosmetic solutions. Traditional methods, such as shaving, depilatories, tweezing and waxing result in only temporary hair removal, and thus require extensive maintenance¹. Long-term hair removal via electrolysis is generally unsatisfactory due to its time-consuming, painful nature and the associated risk of scarring or pigmentary changes^{2,3}. Moreover, only 15-50% of the unwanted hair is removed through electrolysis and its efficacy is considered highly user-dependent^{3,4}.

The more modern approach to long term hair removal involves laser and Intense Pulsed Light (IPL) treatment modalities. These technologies are based on the scientific principle of selective photothermolysis – during treatment, the emitted light energy is absorbed by the hair's pigment (melanin) and is then converted into heat. The heat energy is transmitted through the hair shaft and into the follicle, causing a rise in the hair and follicle temperature. This leads to destruction of the follicle and disruption of the hair growth mechanism, while leaving the surrounding skin undamaged⁵.

Both laser and IPL devices have been proven successful in inducing long term reduction of hair density, as well as delayed hair growth, while causing minimal discomfort and complications^{6,7}. The IPL technology differs from lasers in various physical aspects. The main difference is that while lasers emit light at a distinct wavelength, IPL delivers a wide range of wavelengths, allowing greater flexibility in adjusting to various skin types and body areas, which may differ in terms of hair depth, thickness or color.

The following report describes the results of a multi-center study (six sites), conducted in order to evaluate the performance of the IPL-based Elora system in the removal of unwanted hair. This system also performs IPL Skin Treatments using Photorejuvenation, intended for various skin blemishes and signs of photoaging.

METHODS

Treatments were performed using the IPL Elora system (Lumenis) with a wavelength range of 570-1200 nm and fluence levels of up to 22 J/cm².

A total of 108 individuals, 99 women and 9 men (ages 16-61, average 33 ± 9 years), were enrolled in the study after meeting the inclusion criteria. The treated individuals' skin types were classified as 'light' (30%), 'medium' (48%) and 'dark' (22%); the hair color consisted of black (70%) and several shades of brown (30%). A total of 139 body areas were treated, divided into eleven categories – underarm, bikini, back, neck, toe, arm, buttock, chest, shoulder, calf, stomach; underarm and bikini being the most requested areas for treatment (48% and 36%, respectively). Six treatments were performed at 6-week intervals. The study participants were instructed to stop all methods of hair removal prior to the first treatment (shaving, 10 days; waxing and tweezing, 30 days) to allow the hair growth cycle to return to normal. Hair count in a 1.5 x 1.5 cm² quantification area was performed prior to each treatment by placing a specially designed sticker in the same location within the treated area (based on its distance from a permanent skin mark, e.g. nevus). The treated areas, including the labels, were photographed prior to each treatment.

Following the hair count and photography, the hair was shaved off and a 1-2 mm thick layer of cold gel was applied to the designated area in order to improve coupling of the light to the skin and reduce the skin's temperature during the procedure. The user then chose treatment settings, utilizing the pre-defined parameters incorporated into the Elora, based on the treated skin type and hair. The three available programs ('1' to '3') are designed so that program '1' generates milder parameters and is intended for dark-skinned individuals, while



program '3' involves stronger parameters and is intended for fair-skinned ones. Three energy levels ('low', 'medium', 'high') can be applied in each program, allowing greater customization of the treatment settings to the hair color of the individual. The 'low' energy level is intended for dark and coarse hair, while the 'high' energy level is intended for finer hair. In all cases, the treated hair was at least one tone darker than the skin. After placing the treatment head perpendicular to the skin with the light guide end immersed in the gel (and touching the skin), the device was activated to trigger a pulse. The treatment head was moved and pulses were delivered throughout the designated treatment area, while paying careful attention to avoid any overlapping. Swelling (edema) and/or reddening (erythema) around the hair follicles (the peri-follicular area) are considered a normal immediate response, indicative of the effectiveness of the administered treatment.



The study's main endpoint, i.e. hair clearance rate, was calculated by comparing the number of hairs in the quantification area at baseline (prior to the 1st treatment) to the number of hairs in the same area at each visit afterwards. Immediately after the 1st treatment, the treated individuals were asked to rate the pain level which they felt during the treatment. The study participants were instructed to use high factor sunscreen (at least 30 SPF) and avoid sun exposure, tanning beds or any other form of artificial tanning during the entire treatment course. They were allowed to shave the treated area between treatments, if desired.

RESULTS

Since no statistically significant differences were found between the results obtained from the six sites, the results of all 108 treated individuals (139 treated body areas) are reported as one group. This finding reflects the simple, reliable and user-independent nature of the Elora.

The efficacy of the treatment, as shown in the median number of hairs measured at every time point, is presented in the following graph. The last follow-up in the graph is at 30 weeks, immediately prior to the 6th and final treatment. The number of treated areas at each follow-up visit differs from the initial 139 treated areas because it includes only those areas for which hair count data was recorded at each visit (depending upon which stage each participant reached in the study).

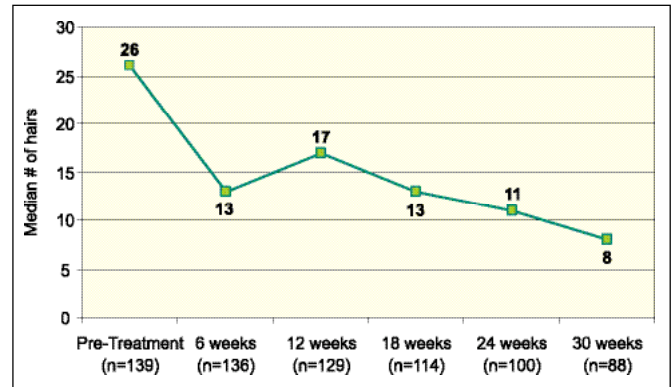


Fig. 1: Median number of hairs at each study visit
(n = number of treated areas)

As can be seen in Figure 1, as a result of the Elora IPL treatment, the median hair count in the quantification area significantly decreased from 26 hairs at the pre-treatment count to only eight hairs at the 30 week follow-up. The impressive hair reduction is also reflected in the high clearance rates that were obtained, ranging from 53% after a single treatment and reaching as high as 71% at the last follow-up. These clearance rates were found to be statistically significant ($p < 0.001$) at all time points.

Immediately following the 1st treatment, the treated individuals reported having felt no pain or up to moderate pain for most of the treated areas (72%); this percentage represents 89 of the 124 treated areas for which a pain level assessment was recorded.

Marginal side effects were occasionally recorded, generally consisting of mild erythema, edema or irritation, and were all resolved within a couple of hours without hindering the treatment schedule.

The sets of before and after photographs (Figures 2-4) illustrate the dramatic photo-epilation effect achieved with the Elora.

DISCUSSION

The results of this study clearly indicate that the Elora offers a safe and effective hair removal solution for different combinations of skin/hair colors and for various anatomical sites with minimal discomfort. The physical characteristics of the Elora and its pre-defined parameter settings enable safe and effective utilization, assuming proper use and appropriate selection of the individuals to be treated in order to avoid contraindications.

The reported results of this study are compatible with those of previously published studies involving the IPL

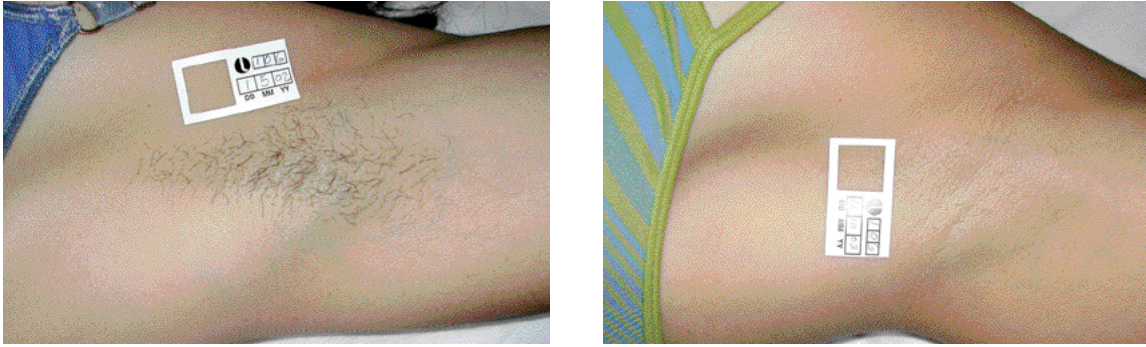


Fig. 2: 39-year-old female with underarm hair before (left) and after 4 Elora treatments (right)

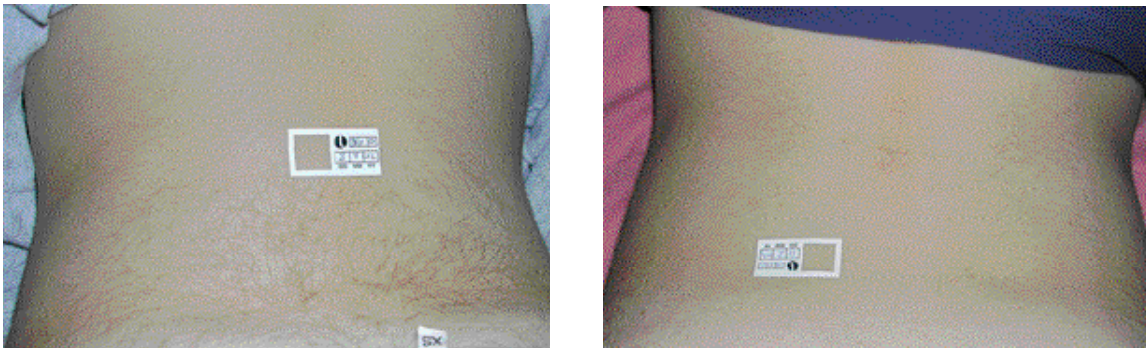


Fig. 3: 16-year-old female with lower back hair before (left) and after 5 Elora treatments (right)



Fig. 4: 39-year-old female with bikini line and thigh hair before (left) and after 5 Elora treatments (right)

treatment modality⁷⁻⁹. Furthermore, it has also been shown in various studies that the hair clearance rates remain stable over a long follow-up period (up to one year), suggesting that the described results in this study will also be maintained over time¹⁰⁻¹².

The Elora system was also designed for ease of use in terms of form and function. This is revealed in its aesthetic and compact design (only 20 kg), which allows mobility and easy operation. The ergonomically designed treatment head is small, allowing comfortable and secure

grip; nevertheless, it incorporates a large spot size of 20 x 30 mm. This rectangular spot covers a large area, thereby affecting many hair follicles with each pulse. This shortens the required treatment time, which is of special importance when treating considerably-sized areas such as the back or legs. Most important are the system's built-in parameters, which enable quick and simple operation of the Elora by users of different background and experience levels, following only a brief training session. The design of the Elora, combined with its proven clinical performance, present an excellent choice for IPL treatments.

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