Broad Band Light and Skin Rejuvenation

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KEYWORDS

• Broad band light • Skin rejuvenation • Pulsed light

KEY POINTS

- Over the past 25 years, broad spectrum pulsed light has established its place in aesthetics and laser medicine.
- Pulsed light has proven its usefulness, effectiveness, and versatility in treating a multitude of skin problems, delaying skin aging, maintaining healthy skin, and as an adjunct to a cosmetic surgical practice for noninvasive skin rejuvenation and in the treatment of postsurgical scars.
- Practitioners contemplating adding a pulsed light device to their practice should choose a device that has at least 4 important features: (1) a large spot size, (2) variable-sized smaller spot adaptors, (3) pulse rates of at least 1 pulse per second, (4) a wide range of cutoff filters, including 515 nm, 560 nm, 590 nm, 640 nm, and 695 nm to treat most skin types.

INTRODUCTION AND EARLY HISTORY OF INTENSE PULSED LIGHT

Pulsed light energy devices for medical and aesthetic use were initially developed in the early 1990s. Pulsed light referred as intense pulsed light, or IPL, was the product of the Israeli medical device manufacturer, Israeli Company Energy Systems Corporation (ESC [Yokneam, Israel]).

The first broad spectrum pulsed light device was introduced in the early 1990s by ESC. The first IPL was branded PhotoDerm. This initial IPL device used a xenon flash lamp that emitted a pulse of light in the visible and infrared spectrum. This light would be filtered using specially coated cutoff filters. The early filters worked by blocking shorter wavelengths of light so the skin was exposed to wavelengths of light above the cutoff filter. Cutoff filters of 515 nm, 560 nm, and 590 nm were available to the practitioner.

In addition, the practitioner could vary the pulse duration and interpulse interval, delivering a train of up to 3 consecutive pulses. The practitioner could adjust the energy fluence with maximum fluences up to 45 J on the PhotoDerm.

The initial device did not offer contact cooling. The initial IPL device had a single spot size and repetition rate of 9 seconds. This initial IPL design: xenon flash lamps, cutoff filters, high maximum fluences, and ability to vary the pulse durations, has formed the basis of the designs of the successor IPL technologies. A specific IPL from ESC was Food and Drug Administration approved for the specific treatment of leg telangiectasis.

The initial experience with IPL in the United States was mixed, with many practitioners finding the results of leg vein treatments to be unsuccessful and often problematic, causing superficial burns and hypopigmented and hyperpigmented crystal coloration in the rectangular shape of the treatment.

Indeed, by 1998, the US experience with IPL, although limited to less than 200 practices across the country, was mainly a negative view of IPL for its approved indication of the treatment of leg veins.

Some laser experts maintained that IPL had no place in dermatology or laser medicine or aesthetics. Indeed, ESC was facing a class action lawsuit filed by a group of physicians alleging the

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Facial Plast Surg Clin N Am 28 (2020) 29–36
https://doi.org/10.1016/j.fsc.2019.09.014

technology was not represented accurately as an effective treatment for leg veins.

At the same time, some IPL practitioners were individually recognizing that IPL could result in hair reduction and was also effective for some benign pigmented skin lesions, such as lentigines and freckles and small facial vessels.

EARLY OBSERVATIONS

These early observations were based on the spot treatment approach, whereby only 1 area of the face with visible vessels or pigmented spots or areas of undesired hair growth were treated. These early treatments typically were a single pulse over the affected area. During this same time period, it began to be appreciated that IPL was most suited for fairer skin types (Fitzpatrick skin types I through III). It was also observed that complications of superficial burns resulting in hypopigmentation and hyperpigmentation were most common when tanned skin or darker skin types were treated.

Some IPL practitioners maintained that IPL was not a suitable technology for ethnic skin types or any skin type beyond Fitzpatrick skin type III. Other IPL practitioners found that by reducing the fluence, using higher-numbered cutoff filters, and lengthening the pulse durations, some patients with skin types IV and V could have pigmented spots treated or hair removed. Problems still occurred, however, because the initial crystal size was often much larger than the size of the target vessel or pigmented spot even when the settings were more conservative. The result left an area the shape of the crystal spot size that contrasted with the surrounding untreated skin.

During this time, there was a growing awareness among IPL practitioners that IPL was useful in the right patient population for fair-skinned individuals, for hair removal, and for select and benign pigmented and vascular lesions, primarily of the face. It was not until the initial presentation and introduction in August 1998 at an International Dermatology Conference in Athens, Greece by the author, describing a technique of using IPL as a full facial treatment and performing a series of sequential treatments, that IPL truly gained traction as a potentially useful treatment for photoaged skin. The author's results of this technique as a series of full-face IPL treatments for photorejuvenation was published in *Dermatologic Surgery*.[1]

The results of this treatment presented by the author demonstrated the gradual clearing of many of the signs of photo damage: freckling, fine wrinkles, larger pores, as well as erythema and telangiectasis, without the downtime that was seen with the ablative carbon dioxide and Erbium:YAG lasers. Even the widely used pulse dye laser for vascular lesions produced purpura at treatment sites that could take up to 10 days or more to resolve.

Over the next 20 years, IPL has evolved to become a well-accepted multimodality technology for skin rejuvenation and treatment of vascular and pigmented lesions and for hair removal.

There are now more than 2 dozen companies worldwide that manufacture IPL devices. The original company, ESC, has evolved to become Lumenis. There are estimated to be well over ten thousand IPL devices worldwide, and more than ten thousand IPL practitioners at the time of this publication. It is probable that more than 20,000 IPL treatments are performed daily in the United States alone.

PRESENT DAY ACCEPTED USES OF PULSED LIGHT ENERGY DEVICES

There have been several key innovations in pulsed light technology and techniques that have been introduced during the past 20 years that have resulted in improved treatment results, reduced complications, faster treatment times, and new clinical applications. In the author's opinion, the most important innovations in technology have been (1) faster repetition rates, (2) larger spot sizes, (3) variable-sized spot adaptors to allow a focused spot treatment of small vascular and pigmented lesions, (4) contact cooling, (5) a continual pulsed mode, and (6) expanded spectrum of cutoff filters.

Faster repetition rates have made for more practical treatment of large skin areas. Areas, such as arms, legs, back, and treatments of face, neck, and chest can now be treated at a single session in a fraction of the time it took to treat with the original IPL device. Repetition rates of up to 3 Hz are now available. Larger spot size combined with these faster repetition rates has reduced treatment times for large areas from an hour or more to 10 minutes or less.

Variable-sized spot adapters that were the innovation of Sciton Medical (Palo Alto, CA, USA), affixed to the large spot crystal, have allowed the focused targeting of small vessels and small pigmented lesions with much higher and more effective settings that could otherwise cause a complication if the large spot size was used. In addition, spot adaptors as small as 3 mm have made possible the treatment of lesions in locations such as the canthus, lower lids, alar folds, and ears.

The innovation of constant cooling of the crystal to temperatures as low as 0°C (Sciton Medical; BBL) as a means to protect the epidermis when higher fluences are used has reduced the complications of superficial burns while making treatments more comfortable for patients.

The availability of up to 7 different filters (Sciton Medical), including 420, 515, 560, 590, 640, 695, and 800, to the practitioner has expanded the range of skin types to now include the treatment of even skin type 6 (the darkest skin type on the Fitzpatrick scale) possible. The cutoff filter functions to change the spectrum. By choosing the appropriate cutoff filter, which alters the light spectrum of the xenon flash lamp, the proper fluence, pulse duration, and contact cooling, all skin types can now be safely treated.

Finally, the continual pulse mode innovation introduced by Sciton in 2008 for the purpose of skin tightening has become an exciting technology not just for nonsurgical skin tightening, but also for a growing spectrum of new clinical applications of broad spectrum light that were previously not possible.

KEY INNOVATIONS IN TREATMENT, RESEARCH, AND EDUCATION

The key technique innovations of pulsed light technology are as follows:

1. A multiple-pass technique (as developed by the author)
2. A 2-step technique for skin correction and photo-rejuvenation (as developed by the author)
3. Observing and recording the pulse counts for each treatment. The recording of pulse counts for each step of the treatment has led to more consistent predictable and reproducible outcomes, fewer complications, better results, and reduced learning curves.
4. Performing enough treatments (as developed by the author). Initial efforts with IPL were focused on the goals of eliminating vascular or pigmented lesions in a single treatment session.

With time and experience, it became clear that attempting to clear vascular and pigmented lesions in a single treatment session was often not realistic and that more than 1 treatment was necessary.

By taking the multiple-pass treatment approach, expected outcomes were more realistically achieved. Setting a patient's expectations at 3 to 5 treatment sessions in practice was more realistic and allowed for the first treatment session to be more conservative, reducing the 2 most common IPL complications, superficial burns and lack of results.

Another benefit that has come from multiple treatments is the observation that results, in particular, for clarity and textural improvements, were progressive and that the people with the clearest, smoothest, healthiest-appearing skin were those who typically had the most treatments.

Several factors have contributed to the widespread popularity and common use of IPL and broad spectrum light devices. First was the introduction of a technique using IPL for overall skin rejuvenation that was based on a series of full-face or a series of nonfacial skin treatments.

The concept that IPL was well suited as a technology for noninvasive overall rejuvenation of photo-aged skin using a technique of serial, sequential, full-face (or nonfacial) skin treatments was first reported by the author.[1] This landmark study reported on the observations for 49 subjects of the effective rejuvenation of photo-damaged skin using a series of full-face IPL treatments.

One of the major observations reported by the author was that the photo-damaged skin, pigmented lesions, erythema, telangiectasis, and fine wrinkles could be effectively improved with essentially no downtime and minimal complications. Histology of treated skin showed reduced superficial vasculature, reduced dermal melanin, increased collagen, and reduced dermal inflammation. This breakthrough treatment was a major impetus for medical device manufacturers to develop and market pulsed light devices.

Second, with more energy-based device manufacturers introducing pulsed light devices with more advanced features, such as more rapid pulse rates, larger spot sizes, preprogrammed parameters as well as contact cooling, at increasingly more affordable prices, the availability of IPL treatments became more widespread.

Third, educational efforts undertaken largely by the author and Dr Steven Mulholland in treatment techniques, parameters, and various applications of IPL trained several thousand early IPL adaptors and users from 2000 to 2010. These early educational events taught effective IPL techniques and marketing strategies to not only physicians in the core aesthetic specialties of plastic and facial plastics, dermatology, and ophthalmology, but also to many noncore physicians who were making their first foray into a cash-based aesthetic medicine practice.

In addition, many US states allowed nonphysicians to operate IPL devices. Early IPL training events also included many nurses, aestheticians, and nonmedical laser technicians. Another benefit

of these early IPL educational events was to dispel the misconceptions and myths of IPL that had deterred the early adoption of IPL as having a legitimate place in laser medicine.

Finally, because of the generally favorable and patient-pleasing outcomes of IPL treatments, the popularity of IPL treatments grew substantially. In 2019, more than 30 laser device manufacturers now offer an IPL device.

PRESENT USES OF INTENSE PULSED LIGHT TECHNOLOGY IN AESTHETIC AND LASER MEDICINE

The present well-accepted and common uses of pulsed light include both corrective and adjunctive benefits. The author has developed advanced courses on both IPL and broad spectrum light treatment methodology that he continues to teach today to educated users on treatment methodology, including Corrective Benefits of Pulsed Light Technology, Adjunctive Benefits of Pulsed Light Technology, and Future Uses of Pulsed Light Technology.

Corrective Benefits of Pulsed Light Technology include the following: (1) noninvasive photo-rejuvenation of photo-damaged facial and nonfacial skin; (2) treatment of vascular and erythematous conditions, including rosacea, poikiloderma, general erythema, telangiectasis, and benign pigmented lesions; (3) acne; (4) scars and purpura; (5) hair reduction and removal; (6) delay of skin aging; (7) wrinkle reduction; and (8) skin-laxity and skin-tightening treatment.

The adjunctive benefits of Pulsed Light Technology include the following: (1) the early treatment of post surgical scarring and red, raised surgical scars, (2) ecchymosis and purpura post-procedure, (3) postlaser erythema, and (4) post-inflammatory hyperpigmentation.

Of the well accepted clinical and aesthetic benefits of pulsed light treatments, rejuvenation of photo-damaged skin and improvement in the symptoms of rosacea are the 2 most common applications of pulsed light.

PHOTO-REJUVENATION WITH PULSED LIGHT

Since the introduction of the serial full-face technique with IPL in 2000 by the author, photo-rejuvenation of photo-damaged skin has become the most popular and widely accepted use of pulsed light. Most of the signs of chronic sun exposure, such as freckling, fine wrinkling, telangiectasis, erythema, and larger pores, are visibly improved with a series of pulsed light treatments.

The recommended technique for consistent, predictable, and reproducible results is a multiple-pass, 2-step technique. With this technique, the first step is performed as 2 passes using conservative parameters. Typically, a 515-nm or 560-nm cutoff filter is used for Fitzpatrick skin types I through III, and 590 nm for Fitzpatrick skin types IV. Lower fluence, generally less than 10 J cm, depending on the specific device, is used.

The purpose of the first step is to produce a general overall clearing of freckled pigmentation and a smoother texture to the skin. The first step is responsible for stimulating new dermal collagen, producing favorable gene expression changes in keratinocytes and dermal fibroblasts. It is the first step that results in clearer, smoother, healthier-appearing skin as well as providing antiaging benefits.

By performing 2 passes at lower fluences, the complications of uneven striping and superficial burns are largely eliminated.

The second step of this technique uses higher fluences and smaller spot sizes to specifically target telangiectasis, areas of erythema, stubborn pigmented lesions, wrinkles, and scars that may not resolve as effectively with the lower fluences used in step 1.

The advantages of the multiple-pass, 2-step technique for photo-rejuvenation over the early single-pass, high-fluence technique are better overall results, greater textural improvements, and elimination of complications, such as uneven results, striping, superficial burns, and lack of results. In addition, the multiple-pass, 2-step technique is more comfortable for patients. Depending on the device used, typical full-face treatments with this technique may be 240 to 400 pulses.

This same technique is used to treat any nonfacial photo-aged skin. The most popular are the neck, chest, and dorsal hands.

TREATMENT OF ROSACEA, ERYTHEMA, TELANGIECTASIAS

Although the early experience with IPL for spider leg veins was not successful, the treatment of rosacea with its various symptoms of telangiectasia and erythema is highly successful with pulsed light. Indeed, the author's experience with IPL and broad spectrum light in several thousand patients for rosacea has shown high success rates of up to 90% to 100% resolution of erythema and flushing for periods of up to 5 or more years following a series of 5 treatments.

The author uses the multiple-pass, 2-step technique (as developed by the author) for facial rosacea and erythema of the neck (Poikiloderma

Civatte) and décolleté. The author has observed that all symptoms of rosacea, including erythema, flushing, burning, telangiectasis, inflammatory papules, and ocular rosacea, improve with a series of full-face pulsed light treatments. Typical parameters for step 2 for rosacea use the 560-nm filter for Fitzpatrick skin types I through III and 590-nm filter for skin types IV. Higher fluences, such as 15 to 18 J, with the Sciton BroadBand Light (BBL) device are used. It is recommended to use an additional external cooling for this step to help increase patient comfort and reduce posttreatment swelling.

Although rosacea symptoms improve dramatically with pulsed light treatments, the author recommends a maintenance treatment every 6 months to keep patients symptom free. Also, 25% of rosacea patients may need more than 5 treatments to achieve 75% or greater reduction in erythema and flushing.

In 2019, pulsed light treatments continue to be one of the most effective and valuable treatments for rosacea, general erythema, and flushing.

TREATMENT OF ACNE WITH PULSED LIGHT

Another inflammatory condition that has proven to respond well to pulsed light treatments is acne vulgaris.

The author published a paper describing a 3-step technique using BBL to simultaneously treat both inflammatory acne and acne vulgaris.[2]

The first step is 5 to 6 passes using the blue spectrum of light (420 nm to 480 nm). This narrow band of blue light spectrum is achieved using a specially coated filter. The purpose of the blue light step is the reduction of new inflammatory acne lesions.

The second step is 2 passes using the 560-nm cutoff filter (590-nm cutoff filter for Fitzpatrick skin types IV) and similar parameters that are used for the treatment of rosacea (560 nm, 15 J cm, 15 milliseconds, 15° contact cooling with the broad spectrum light device). The purpose of this step is the simultaneous resolution of active acne and improvements in erythematous and violaceous raised or depressed scars.

A third step using an innovative continual pulsed mode setting (Skintyte, BBL device; Sciton) results in rapid resolution of active acne and reduction of new acne lesions. Results with this multiple-pass 3-step technique are very rapid resolution of active inflammatory papules and cysts (1 to 7 days) and reduction in erythematous acne scars. Indeed, if the acne scar is erythematous and elevated or depressed, it becomes smoother and less erythematous.

Results in a series of 100 patients have shown complete to nearly complete resolution of inflammatory acne, including cystic acne in 80% of patients with a series of 8 weekly or biweekly treatments. Remission of inflammatory acne can be up to 6 months after the last treatment. The 3 primary benefits of pulsed light for acne using this 3-step technique are as follows: (1) rapid resolution of inflammatory acne, (2) improvement in erythematous scars, and (3) a nondrug treatment option for people with inflammatory acne. Although relapse of inflammatory acne may occur after 3 months, improvement in acne scarring is permanent.

TREATMENT OF SCARRING WITH PULSED LIGHT

Pulsed light is very effective in improving the erythematous, violaceous, or hyperpigmented scars. In the author's experience, the sooner a newly formed scar is treated, the better the aesthetic improvement. Pulsed light is especially effective in the early treatment of new surgical scars. The author recommends initiating the first pulsed light treatment on a facial surgical scar at 1 week after suture removal and 2 weeks after suture removal for nonfacial scars. When a scar is in the erythematous stage, pulsed light treatments are especially efficacious to reduce the erythema and flatten an elevated scar or fill in a depressed scar.

It is the author's practice to treat all surgical scars with pulsed light at the earliest time. It is the author's contention that pulsed light should be regarded as the first line of treatment of choice for surgical scars. Early intervention with pulsed light may help prevent a hypertrophic or keloid scar.

The technique used for treating surgical or traumatic scars is 2 to 3 passes over the scar overlapping pulses 10% to 20%. The most effective parameters for scars are those used to treat erythema and telangiectasis for rosacea. The smaller spot sizes that are approximately the width or size of a scar are chosen over the largest spot size unless a scar is particularly large. The author recommends a series of 3 to 4 pulsed light treatments with 1 treatment every 3 to 4 weeks.

Scars that have been successfully treated are facial and body excisional scars, hypertrophic scars, breast surgery scars, abdominoplasty scars, brachioplasty scars, full- and split-thickness skin grafts, liposuction scars, burn scars, radiation scars, orthopedic scars, and hypertrophic scars over joints (elbows, ankles, knees, fingers). In general, the response to pulsed light of all these various scars is similar with gradual fading of erythema and smoothing of the scar over several weeks. Pulsed light is effective on new scars and avoids further

injury to a healing wound as occurs with ablative and fractionated scars and microneedling devices. It should be an essential tool in an aesthetic surgeon's practice.

HAIR REDUCTION WITH PULSED LIGHT

One of the early benefits of IPL was the observation of permanent hair reduction of dark hairs. Over the years, pulsed light has proved quite effective as a tool for safe and permanent hair reduction. The general principles for effective hair reduction with pulsed light are as follows. Dark hair responds; white hair does not. Two to 3 passes are more effective for hair reduction than a single pass, and higher number cutoff filters and higher fluences and longer pulse durations produce safe and effective hair reduction of dark terminal hairs in Fitzpatrick skin types I through IV. Because of the beneficial effect of pulsed light inflammatory lesions, pulsed light is especially effective for hair reduction, where pseudofolliculitis and inflammatory or hyperpigmentation are present.

Because of the effect on hair growth, an important consideration to take into account is when IPL is used where hair removal is not desired such as the beard area in men. To avoid undesired hair loss, it is recommended to either avoid treating areas where the patient does not desire to lose hair (eg, moustache or beard area) or to use very low fluences or small spot sizes to target lesions (vessels or pigmented lesions) in beard areas.

DELAY OF SKIN AGING WITH PULSED LIGHT

One of the most important newer benefits of pulsed light treatments is the reported observations that regular treatments with pulsed light improve not only the appearance of aging skin but also skin appears to age more slowly. One of the early reports of the antiaging effects of pulsed light was reported in *Cutis* by the author and Dr Jason Pozner.[3] This retrospective photographic evaluation of 15 subjects receiving at least 1 and up to 4 BBL (Sciton Medical) treatments each year over an average of 9 years were judged by blinded evaluators to be the same age as their 9 -year-younger pretreatment photographs.

Other studies have confirmed the age-delaying effect of regular pulsed light treatments. In an interesting study looking at changes in gene expression of skin cells on forearm skin biopsies following 3 monthly treatments with BBL using a multiple-pass technique, Dr Chang, along with the author and colleagues from the Dermatology department at Stanford University School of Medicine, found nearly 1300 genes were "functionally" rejuvenated at 1 month after the last BBL treatment.[4] Key genes related to cell division, tumor suppression, and cell and organism longevity were rejuvenated to show messenger RNA levels similar to those found in skin biopsies of women in their twenties, even though the test subjects were aged 70 years.

The implications of the age-delaying effects of regular BBL treatments are profound and wide reaching. Patients now have the opportunity to not only keep their skin healthy but also keep their skin more youthful as they age. Skin anywhere on the body can benefit from the age-delaying effects of regular pulsed light treatments.

WRINKLE REDUCTION, SKIN LAXITY, SKIN TIGHTENING TREATMENT WITH PULSED LIGHT

The observation of wrinkle reduction with pulsed light treatments is directly related to technique. The author has observed that the greatest skin texture improvements with pulsed light correlate with the greater number of pulses and passes performed at each treatment.

In general, fine wrinkles of the cheeks and crepey skin of the neck and fine wrinkles of sun-exposed skin improve the most. Wrinkles etched into the skin from repetitive muscle movement may also improve with repeated pulsed light treatments. Interestingly, wrinkle improvement seems to be correlated with more passes, regardless of the fluence or cutoff filter.

Delivery of pulsed light using a continual pulse mode is available on some IPL devices. BBL (Sciton Medical) uses a continual sequential pulsing of 2 xenon flash lamps that allow delivery of a continual train of pulses over several seconds. When this mode is used with a continual motion technique and the 590-nm cutoff filter (red and infrared light) or 800-nm cutoff filter (infrared light only), gradual skin and soft tissues are gradually heated. Target temperatures range from 40°C to 42°C, and treatment duration is 2 to 6 minutes at each treatment site.

The process of using Broad Band Light for bulk heating of skin and soft tissues produces collagen contraction and some degree of new dermal collagen formation. Both collagen contraction and neocollagenases can result in a modest degree of visible skin tightening. Typical treatment areas are cheeks, submentum, lower lids, infrabrow, and neck. Results seem to be technique dependent with better results achieved when target temperatures are sustained for up to 4 minutes. Results may last for 2 to 4 months after 1 to 4 treatments.

ADJUNCTIVE BENEFITS OF PULSED LIGHT

There are several beneficial adjunctive uses of pulsed light. The benefits for improving postsurgical scarring early in the course of wound healing have been previously discussed. Pulsed light can be used to more quickly resolve procedure purpura and ecchymosis.

Purpura following injections can be performed the day after injections for any kind of filler or neuromodulator without concerns of diminishing the effect of the neuromodulator or correction and longevity of the filler.

Parameters are similar to those used for rosacea and scars. General guidelines are the darker the bruise, the lower the fluence. Dark ecchymosis or hematosis presents a large amount of extravasated hemoglobin as a target to the light. A parameter with a fluence that is too high can produce excessive heat that could result in a thermal burn. Many times a single pulsed light treatment over an ecchymosis can reduce the visible bruise effect 50% in 12 to 24 hours.

Pulsed light for swelling ecchymosis following a facelift procedure is best delayed for at least 2 weeks after the surgery to allow wound healing and reduction of swelling.

Pulsed light is an effective adjunctive treatment to resolve postablative laser erythema or postinflammatory hyperpigmentation. The author recommends waiting 2 to 3 weeks after full laser ablation and 7 to 10 days after fractionated laser before doing a pulsed light treatment. Parameters are the same as erythema and scarring, although the greater the postlaser erythema, the more conservative the practitioner should be with the fluence. A general principle is to reduce the fluence 2 J below typical parameters used for scars for the first treatment. Pulsed light treatments can be done every 2 to 3 weeks until erythema is resolved.

FUTURE BENEFITS AND USES OF PULSED LIGHT

Areas where pulsed light may prove to have greater or preventative benefits in the future are possible skin cancer prevention, general body antiaging, and noninvasive body contouring and localized noninvasive fat reduction. Although early anecdotal observation has suggested reduced nonmelanoma skin cancer incidence in people receiving regular pulsed light treatments, these potential benefits need further study.

Systemic anti-aging from pulsed light treatments is conceivable considering the already demonstrated anti-aging effects on skin. Pulsed light devices deliver large fluences of red and infrared light that penetrate several centimeters beneath the skin surface deep into soft tissue and underlying vasculature. The effects of exposing blood circulating through the subcutaneous vascular plexus to visible and infrared light is not yet known. Future studies may show some anti-aging and health benefits that extend far beyond the benefits to skin.

Non-invasive fate reduction and body contouring are also conceivable considering the large amount of light energy in the red and infrared spectrum that is able to penetrate into subcutaneous fat heating large areas to temperatures that can begin to disrupt fat cells. Future studies to delineate the optimal parameters and treatment protocols will likely confirm pulsed light as an effective adjunctive treatment of fat reduction and body contouring.

SUMMARY

Over the past 25 years, broad spectrum pulsed light has established its place in aesthetics and laser medicine. Pulsed light has proven its usefulness, effectiveness, and versatility in treating a multitude of skin problems, delaying skin aging, maintaining healthy skin, and as an adjunct to a cosmetic surgical practice in the treatment of postsurgical scars.

Practitioners contemplating adding a pulsed light device to their practice should choose a device that has at least 4 important features: (1) a large spot size; (2) variable-sized smaller spot adaptors; (3) pulse rates of at least 1 pulse per second; (4) a wide range of cutoff filters, including 515 nm, 560 nm, 590 nm, 640 nm, and 695 nm, to treat most skin types.

In addition, most practitioners should seek the best training by an experienced physician pulsed light practitioner. Training should cover the various applications of pulsed light, techniques, and parameters specific to each pulsed light device. Training should also cover prevention and management of pulsed light complications. If treatments are delegated to nonphysicians, each provider should receive the same thorough training before using pulsed light. Contrary to some technologies and devices introduced in the last 20 years, BBL will continue to be one of the major energy devices of laser and aesthetic practices.

The future of BBL is very bright as new technology and innovations make current treatments faster, more effective, and more cost-effective and continue to drive the discovery of a variety of new applications.

DISCLOSURE

None.

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