

REGISTER  
FOR ACE 2020  
TODAY!

# Aesthetics

MONTHLY JOURNAL FOR MEDICAL AESTHETIC PROFESSIONALS

When you reveal beauty,  
we're by your side.



Croma offers a wide range of state-of-the-art products in minimally invasive aesthetic medicine. This allows you to combine techniques for personally tailored treatment and ideal results. Learn more about Croma's products and services at [croma.at](http://croma.at)

HA Filler | Threads | PRP | ACA & SVF | Skincare

**croma**  
For creators of beauty.

## Treating the Neck CPD

Dr Souphiyeh Samizadeh explores neck rejuvenation with injectable treatments

## Special Feature: Tackling Skin Conditions

Dermatologists share successful patient case studies

## Ageing and Pigmentation

Dr Amiee Vyas treats a patient with pigmentation and ageing with skincare

## Referring for Hair Concerns

Dr Ingrid Wilson advises on best referral options for patients with hair loss



We know that one of the drawbacks of IPL treatments is the relatively large area of the output couplers (glass tips). These can be up to around 6cm squared, while many targets may be significantly smaller. This results in large areas of skin surrounding the targets also receiving high energy bursts, leading to potential tissue damage.

This article explores a new masking technique, which I have trialled, that allows for higher fluence and longer pulse widths in the treatment of angiomas and small pigmented lesions – I have called it the ‘hole in a stick’ technique.

### Masking technique overview

I sought to find a way to minimise the adjacent tissue damage that occurs during IPL treatment by masking off those areas during treatments. To do this, I chose standard wooden spatulas, typically found in many clinical facilities, and drilled a hole near one end. I thought wooden spatulas would be safe to use, are easily accessible, and would mask the required area well. Originally the hole was 3mm in diameter, however this proved to be too small for locating targets and clinical outcomes, so I tried 4mm (Figure 1). This size proved more successful.

Firstly, as standard protocol, a small amount of cold water-based gel was applied to the target area for skin cooling. The spatula was then positioned over each lesion individually. The IPL glass tip was then placed on the wooden spatula, so that most of the glass is touching the wood (Figure 1). A single shot was then

fired. In my 20 years of experience in IPLs, I have found that you can achieve better results using higher fluences and longer pulses than described in manufacturer guidelines. Therefore, I decided to apply a fluence of 41J/cm<sup>2</sup> with an envelope pulse width of 94 milliseconds over the wavelength range 500 nm to 1200 nm. The aim of this was

## Treating Pigmented Lesions

Physicist and bioengineer Mike Murphy presents a new masking technique for treatment of angiomas and small pigmented lesions using IPL

**Photothermal treatments using intense pulsed light (IPL) systems may be used to effectively remove hair, vascular and pigmented lesions without damaging surrounding tissues<sup>1,2,3</sup>**

However, I have noticed that many IPL users do not utilise sufficient energy densities or pulse widths to successfully destroy the target tissues. Consequently, these practitioners then achieve poor clinical results and conclude that IPL isn't as effective at treating these concerns as lasers.

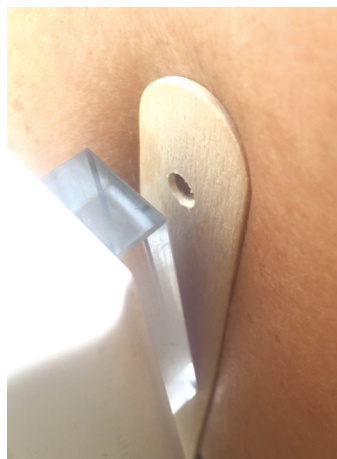


Figure 1: A 4mm hole is drilled onto the spatula, which is placed against the skin. The IPL output tip is positioned on the wood so that only the skin under the hole is exposed to the light energy.



Figure 2: After only a few shots (typically around five to eight) the water content of the wood is greatly reduced by the heat energy, resulting in carbonisation of the wood.

In my 20 years of experience in IPLs, I have found that you can achieve better results using higher fluences and longer pulses than described in manufacturer guidelines

to maximise absorption by haemoglobin and melanin.<sup>4,5</sup>

It should be noted that such high energy densities will inevitably cause the wood to carbonise within just a few pulses. This is quite evident with a burning smell and obvious marks on the wood surface (**Figure 2**). Therefore, to minimise this issue, I decided to soak each stick in water for at least 30 minutes prior to use. I find this allows for a few more shots on the wood before carbonisation begins. These pulse trains were distributed over five sub-pulses with a duration of 10ms each and a gap of 11ms between each sub-pulse. This pulse train was chosen to generate the required fluence while minimising thermal losses during the pulse envelope. Both the fluence and pulse width were measured using an IPL meter designed for this purpose.

## Results

I have carried out a small amount of tests on a number of body areas using this masking technique on a Fitzpatrick skin type II Caucasian 55-year-old female patient, where small benign pigmented lesions and angiomas were treated (**Figure 3 & 4**). The patient noticed a 'slight nipping sensation' with each energy pulse, but reported no long term or undesirable effects. A small amount of oedema and erythema were noted shortly after, as would be expected following such a treatment.<sup>6</sup> These typically subsided within 24 hours. Other skin areas were also tested and yielded similar results with no unwanted side effects. If such a masking technique is not employed in these treatments, then unwanted tissue damage is likely in the adjacent skin areas including blistering, bruising and swelling.<sup>1,6,7</sup> I find that the level of pain is also significantly higher since many more nerve receptors are stimulated by the heat energy.

In my experience, the masking technique has allowed for the higher than 'standard' fluence to be used without any unwanted side effects. It also reduces the likelihood of unwanted damage due to poor skin cooling, since smaller areas are exposed to the light energy. In my experience, using higher fluences coupled with longer pulse widths, the probability of a successful clinical outcome is enhanced.<sup>7</sup>

## Summary

The 'hole in a stick' technique allows for a higher level of energy input into the skin without inducing excess damage. It's a very useful and inexpensive way to mask off unwanted IPL light energy when treating skin conditions. My trials have allowed for a much more targeted treatment of small, discrete lesions with higher fluences and longer pulse widths than might normally be used. Applying such fluence/pulse width combinations, without a mask, may likely damage the adjacent skin, with no benefit. It's important to note that the fluence and pulse width needs to be higher and longer than standard manufacturer protocols. If standard protocols are used, then practitioners are unlikely to see good results. Clinicians should be highly experienced in the use of IPL devices before attempting. Comparative clinical studies would be useful to confirm these initial findings.



Figure 3: Brown pigmented spots and angiomas treated with IPL light energy at 41 J/cm<sup>2</sup> and 94ms. The smaller angiomas and pigmented spots cleared after only one session, while the larger lesions required two. No unwanted side effects were reported by the patient.



Figure 4: A number of pigmented and vascular lesions on the stomach area, before and after one treatment sessions at 41 J/cm<sup>2</sup> and 94ms.

**Disclaimer:** As the fluence and pulsewidth used in this technique are greater than most manufacturer guidelines, practitioners' should use their clinical expertise and judgement. This procedure should only be performed by experienced practitioners.



**Mike Murphy** is a physicist and bioengineer with 34 years' experience in medical lasers. He started Dermalase Ltd in 1989 to launch the QS ruby laser into medical markets in the US, EU and Asia. Murphy is currently the general secretary of the Association of Laser Safety Professionals, is a Certificated Laser Protection Adviser and is registered as an LPA with Healthcare Improvement Scotland. He has published more than 25 articles, reports and papers in peer-reviewed medical laser journals and trade publications.

## REFERENCES

1. Barikbin B, Ayatollahi A, Hejazi S, Saffarian Z, Zamani S. The Use of Intense Pulsed Light (IPL) for the Treatment of Vascular Lesions. *Rev Artic J Lasers Med Sci*. 2011;2(2).
2. Victor Ross E, Smirnov M, Pankratov M, Altshuler G. Intense Pulsed Light and Laser Treatment of Facial Telangiectasias and Dyspigmentation: Some Theoretical and Practical Comparisons.
3. Grillo E, Rita Travassos A, Boixeda P, et al. Histochemical Evaluation of the Vessel Wall Destruction and Selectivity after Treatment with Intense Pulsed Light in Capillary Malformations. *Actas Dermosifiliogr*. 2015. doi:10.1016/j.ad.2015.10.006
4. Anderson RR, Parrish JA. Selective Photothermolysis: Precise Microsurgery by Selective Absorption of Pulsed Radiation. *Science* (80). 1983;220(4596):524-527.
5. Babilas P, Shafirstein G, Bäumlir W, et al. Selective photothermolysis of blood vessels following flashlamp-pumped pulsed dye laser irradiation: In vivo results and mathematical modelling are in agreement. *J Invest Dermatol*. 2005;125(2):343-352. doi:10.1111/j.0022-202X.2005.23773.x
6. Moreno-Arias GA, Castelo-Branco C, Ferrando J. Side-effects after IPL photodepilation. *Dermatologic Surg*. 2002;28(12):1131-1134.
7. Marayianis KB, Vlachos SP, Savva MP, Kontoes PP. Efficacy of long- and short pulse alexandrite lasers compared with an intense pulsed light source for epilation: A study on 532 sites in 389 patients. *J Cosmet Laser Ther*. 2003;5(3-4):140-145.