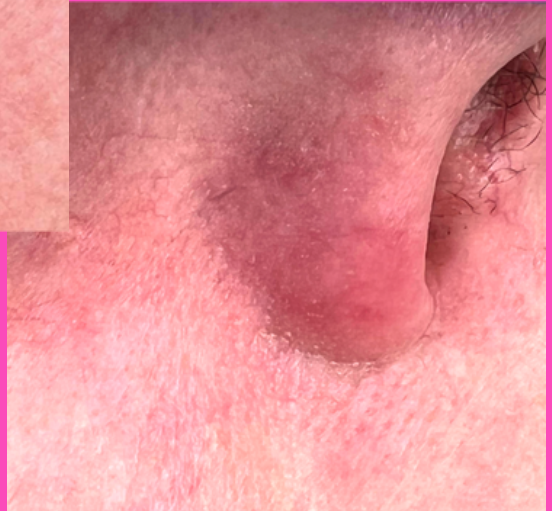
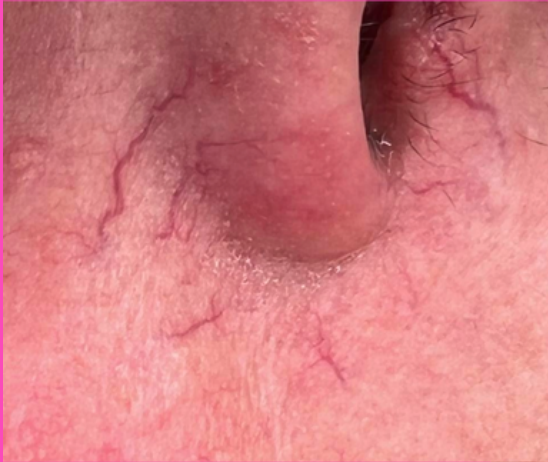


LASER/IPL TREATMENTS



**BEFORE
AND AFTER
PHOTOGRAPHS**

**WHAT YOU SHOULD EXPECT TO
SEE, AND WHAT YOU
SHOULDN'T SEE...**



DERMA-LASE
LASER & IPL TRAINING

**MIKE MURPHY
LISA MCMAHON**
Copyright 2024
Ed. 1

CONTENTS

03 Introduction

04 Laser Tattoo Removal

06 Clinical Endpoints

08 Bad Reactions

15 Pre-cooling the skin

17 Blood Vessels

20 Benign Pigmentation

24 IPL Skin Damage

30 Hair

31 Carbon Dioxide Laser

INTRODUCTION

Laser and IPL treatments have been around for decades, treating all manner of skin issues such as excess hair, tattoos, pigmentation, blood vessels etc.

A variety of lasers and IPLs is now available offering a wide range of treatments and protocols.

However, it appears that the necessary training is not always as good as the technology and many laser users find themselves 'confused' and 'unsure' about what they're doing. Many also don't really know what to expect following treatments and we often see people becoming very concerned about the immediate results.

So, we've put together this little booklet to show some 'before and after' photos, including bad results too. If you know what you, and your patients/clients, should expect to see in the days after a treatment, then nobody should be surprised or concerned at the immediate results.

This booklet shows a relatively small number of cases (with permissions), but we will add more as we collect more interesting photos.



LASER TATTOO REMOVAL



Laser tattoo removal has been around since the early 1980s when Mike's research group applied a Q-switched ruby laser to tattooed skin in volunteers.

This process should be 'subtle', even though a significant amount of energy is applied to the skin. The photo to the right shows the typical reaction we should expect to see immediately after a treatment by a QS or picosecond laser.



If the laser energy is applied correctly, there should be no obvious signs of skin trauma or bleeding. Occasionally, some 'punctate' bleeding, known as 'petechiae' may be visible - small blood spots on the surface. However, there should not be any 'bleeding', as such. If you do see this, then you are not applying the laser energy correctly!

TATTOOS

Tattoos come in all shapes, sizes and colours. Most are easily treated using modern laser technology (as long as it's Q-switched or picosecond duration). But the immediate results should not be 'traumatic'.



Courtesy of Rachel Valhalla, Kilmarnock

Here is a typical result following treatment with a nanosecond Nd:YAG laser. We can see some frosting, erythema and a little bit of swelling - all very normal after such a treatment.

CLINIICAL ENDPOINTS



The only two endpoints we should expect to see after laser tattoo treatments are erythema (reddening) and oedema (swelling). Erythema usually appears within 30 seconds, or so, of the applilcation of the laser energy.

However, the swelling can take a few minutes to appear. There is no need to see any 'frosting' (as in page 5) - this is usually not observed after the first two or three sessions. And we absolutley do NOT want to hear the 'crack' noise!!





We can see the standard clinical endpoints here - erythema and oedema soon after the treatment.

We really do not need to see anything else.

The photo to the right is a perfect example of a post-laser tattoo treatment.



BAD TATTOO REACTIONS



Bad reactions following laser tattoo removal are, unfortunately, quite common. This is usually due to poor practice when delivering the laser energy to the skin.

These pictures show a range of bad results including the loss of the epidermis (above) and excessive blistering or swelling (right).





The photo above shows a particularly bad blistering reaction after laser treatment. This kind of reaction usually indicates that too high a fluence was delivered - too much energy was deposited in the skin which induced unwanted thermal damage.

Occasionally, excessive blistering may occur when the ink particles are released back into the dermis, during treatment. If those particles of ink are toxic, they can induce a similar response.

Blisters should not be burst by the patient. They should be allowed to progress naturally, while the skin is kept clean and dry. If blisters are burst, then the risk of infection increases significantly. If an infection does occur, the patient must seek appropriate medical assistance, immediately.

AFTER-CARE

It is important that your patients/clients follow the aftercare instructions closely. This chap had his third laser tattoo treatment, then went to work in a very dirty environment. He was stripping the walls and ceiling in a shop. The air was obviously full of dust, dirt, bacteria etc. His tattoo was 'invaded' and this occurred!

He went to hospital, who advised him to get a skin graft. Fortunately, he refused. His skin did eventually repair itself, over a few months, but he had learned his lesson!



Please be sure to explain the importance of cleanliness, moisturising and a high SPF factor sunscreen after all laser treatments. Tell them that they may severely damage their skin if they don't follow your instructions. This especially applies to anyone going on holiday to a sunny place - they **MUST** protect their skin against the harmful ultra-violet radiation.

REACTIONS

MULTICOLOURED TATTOOS



The above tattoo was treated using a Q-switched 532nm beam at a low fluence. The purpose was to see the reaction of the various colours to this energy.



It is interesting how the different colours reacted differently to the green 532nm beam. This is perfectly normal due to the various absorptions by the various pigments.

A BAD REACTION



Before treatment

Sometimes, things can go wrong because of the ink in the tattoo itself. In this case, the central area was heavily tattooed - it reacted in this negative way.



6 days later



12 days later

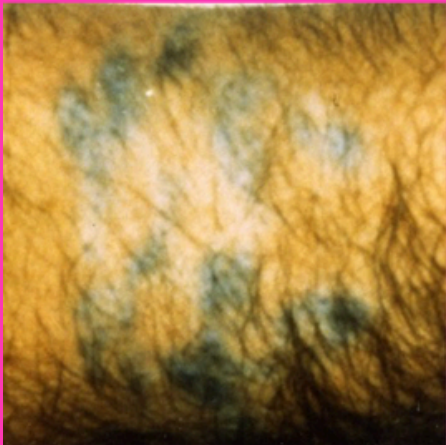
However, applications of Clinisept and Hydranure aided the healing process. After nine weeks, it had healed properly.



At 9 weeks

INK COLOUR CHANGES

Some people call colour changes 'oxidation' - but this is not always the case! The ink has simply undergone a chemical change which alters its colour. It could be 'reduction'!



The red ink in the above tattoo changed to black after the first treatment session. This is simply due to one form of iron oxide (red) changing to another form (black), probably due to the heat.

As we can see above, treating the black ink caused it to fade. It is not usually a problem!



This tattoo was treated using the “R20” technique, using a QS Nd:YAG laser at 1064nm.

To the right is the result after three treatments 20 minutes apart.



Here we see the tattoo about one week after treatment. Clearly the epidermis has been removed in a large area.



About three months later the tattoo is in the process of healing. There was no scarring but we can see dermal reconstruction.



ICE COOLING

Pre-cooling the skin with ice packs can be used in the treatment of tattoos, hair, vessels and benign pigmentation.



These photos show the erythema induced by ice cold packs on the skin. This is perfectly normal.



Pre-cooling with ice packs is very important when applying photothermal treatments. It helps to protect the upper layers of the skin from thermal damage. It also reduces the pain sensation significantly.

It also allows us to apply higher fluences than would normally be endured by patients/clients. This, inevitably, leads to better final results.

Ice cooling after the treatments also helps to remove any unwanted, excess heat energy from the skin.



Ice cooling can be used with any laser or IPL technology!

BLOOD VESSELS



These vessels were treated using an IPL device. The vessels ranged in size, colour and depth.

The photo (right) shows that some of the vessels had shrunk immediately after treatment, but not disappeared completely.



Mike treated this area during a training session. On seeing the immediate result, he realised that he had not used sufficient fluence on these vessels.

At the time, he recommended the client come back for another treatment two weeks later. But, he then realised that this area could have been re-treated immediately, if it had been pre-cooled again with ice for at least two minutes. In doing so, any excess heat would have been extracted, allowing for another treatment soon after.



The photos (left) show some small telangiectasia (thread veins) before and after one treatment with an IPL using a 530nm filter.



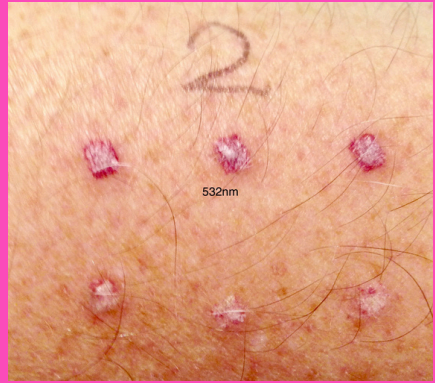
These results are immediately after the treatment. Note the lack of any skin trauma due to the ice cooling before and after the application of the energy.

Port wine stain (PWS) birthmarks can also be treated using IPL light energy. They usually take more than one session, but, as we can see here, the results can be good.



Many blood vessels can be easily removed using light energy from IPLs and lasers, in one session, if applied correctly.

VASCULAR DAMAGE WITH A QS ND:YAG LASER



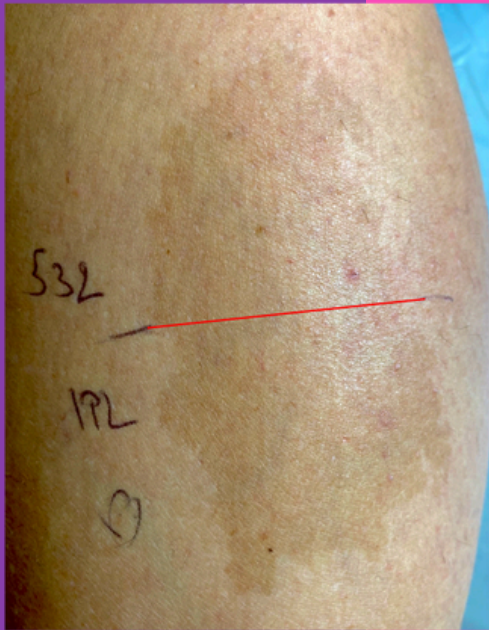
I fired a few shots of QS 532nm energy at my forearm, to see how it would interact with my blood vessels.



As expected, the light energy disrupted my capillaries inducing some 'blood blisters'. However, these faded after a few days leaving a perfectly normal skin.



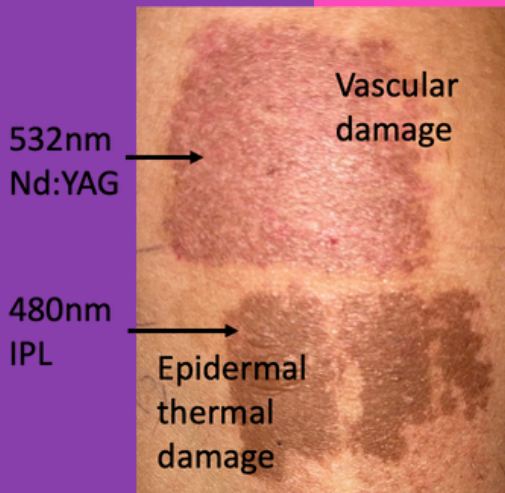
BENIGN PIGMENTATION



The above area shows a 'Café au Lait' pigmentation mark on the calf of a young lady's leg. We opted to treat the upper half with a Q-switched Nd:YAG laser with the 532nm wavelength at a fluence of 2 J/cm^2 .

The lower half was treated with an IPL using a 480nm filter and a fluence of 20 J/cm^2 in a 35ms pulse.

The photo on the right shows the different immediate reactions to these treatments - the 532nm energy has induced a response in the basal melanosomes, leading to 'frosting'. However, the IPL has apparently induced a much more subtle reaction in the skin.



Next day



1 week later

The next day we can see a marked difference in the skin's reaction to each treatment. The 532nm area is now exhibiting clear vascular damage, since capillaries are easily damaged by this wavelength. The IPL-treated area, however, shows more of a blistering reaction, as the epidermis has been clearly damaged.



16 days later



15 weeks later

The final result at 15 weeks, shows that the same endpoint was reached, using both treatment modalities.



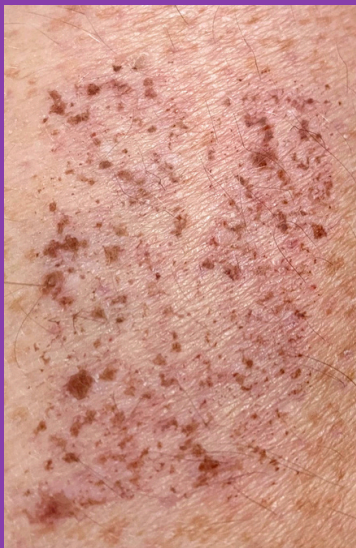
This lady was treated using the QS 532nm beam from an Nd:YAG laser at a low fluence.

Again, we see the frosting occurring from steam formation on the melanosomes, with a little erythema.



These all subsided within a few hours and the skin healed over subsequent days.

Pigmentation can flake off after a few days or it may be consumed within the skin, over time. They don't usually flare up unless an infection is present.



The above photos show an area immediately after being exposed to some IPL light energy. Some minor vascular damage is observed and a little pigmentation too. However, after a few days, the skin had fully recovered and some lightening of the skin is now evident.



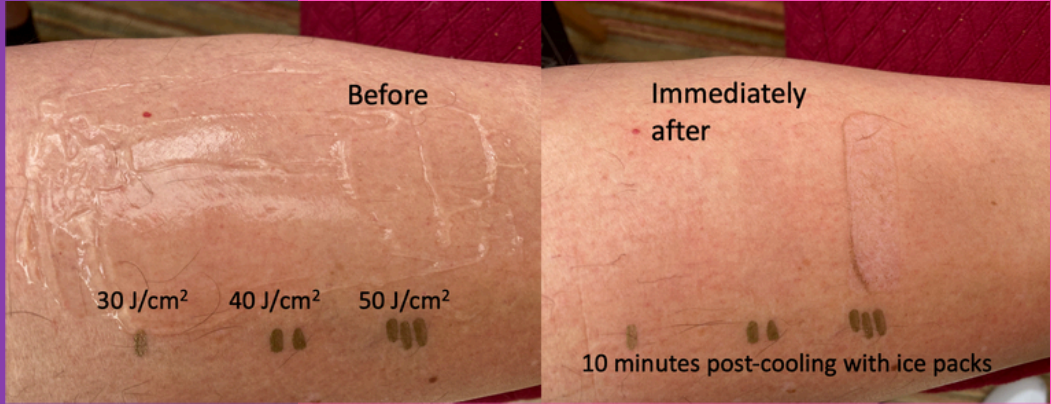
This lady exhibited age spots on her hands.

She had one session of QS Nd:YAG at 532nm and one session of IPL with a 480nm filter, a few weeks later.



The result after these sessions was a significant clearance of the pigmentation.

SKIN DAMAGE FROM AN IPL



4 months later

This lovely lady (Mike's wife!) agreed to a wee test on her leg with an IPL unit. He fired one shot of 30, 40 and 50 J/cm² on her leg with a 430nm filter. This allows through virtually all of the light energy from an IPL Xenon lamp, including all the blue light.

Blue light is very strongly absorbed in melanin, as can be seen in these photos! The 40 and 50 J/cm² areas were significantly damaged.

However, over time all three areas healed. After around 2 years, there is very little sign of damage, and no scarring.

2 years later



This photo shows a small blood spot and a pigmented lesion which were both treated simultaneously using an IPL with a 480nm filter at 40 J/cm² (pre-cooled with ice.)

Here we see two 'track lines' which can occur sometimes with IPLs - these are marks left by the metal cooling plates which are often found on either side of the output tip.



This was the result after four sessions spaced at around three month intervals. The track lines have disappeared and the lesions are almost gone.

LACK OF PRE-COOLING



Here we see examples of IPL burns when the skin has not been properly pre-cooled with ice packs.

Ice is the most efficient way of pre-cooling the skin since they can be applied for an appropriate time. We recommend a minimum of two minutes prior to applying light energy.



The photo (left) here shows what can occur if there is insufficient skin pre-cooling. The epidermis is clearly damaged through excess heating of the basal layer by the light energy.

This photo (right) show the skin after a treatment by IPL. About a week later, much of the epidermis had fallen off leaving some slight burn marks behind.



However, these all healed up over the subsequent weeks. Pre-cooling with ice would likely have prevented these reactions.

SCARRING



This tattoo has been treated with too high a fluence which has induced scar formation. This is unlikely to clear by itself, and will likely be permanent.

HAIR

Removing hair using light energy is the most common aesthetic procedure on the planet today. We can use a variety of lasers and IPL systems to remove hair effectively.

Most problems which occur after the treatment are due to excessive heating without the proper pre- and post-cooling. The excess heat energy is trapped in the dermis which can lead to all sorts of tissue damage.

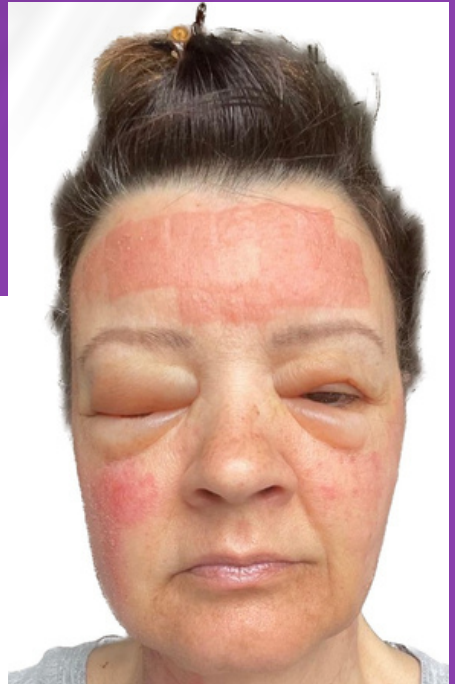


However, a commonly seen issue is folliculitis (above). This is a typically standard reaction to this treatment and usually does not cause any untoward problems. As long as the patient/client follows the proper post-care treatment instructions, they should be fine. This condition may last for a few days, but seldom longer.

They may also experience some erythema after the treatment. Again, this is not anything to be concerned about and will usually resolve itself within 24 to 48 hours.

CARBON DIOXIDE RESURFACING

Fractional skin resurfacing



CO2 treatments can be quite 'aggressive', as seen here. The above photo was taken only around 48 hours after the treatment.



Three weeks later



As we can here, the final result, after 10 weeks, was excellent, with a very smooth skin. The patient was delighted with this result having gone through a short period of discomfort.

Photos courtesy of CJ, Poole and Annette.

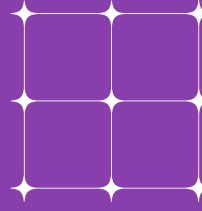
CO2 LASER REMOVAL OF A SKIN LESION



Courtesy of Caroline Maclean, Skinology, Glasgow

This pigmented lesions was checked prior to treatment and found to be benign. A simple and quick CO2 laser treatment removed it easily with no significant trauma. The final result, after two weeks, shows how effective this treatment is.

CARBON DIOXIDE RESURFACING



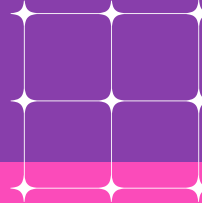
Immediately
after the
treatment.



Photos courtesy of Lisa McMahon.

As we can see, the final result, after 10 weeks, was excellent, with a very smooth skin. The patient was delighted with this result having gone through a short period of discomfort.

COMMENTS...



In this booklet we have shown a few results following laser/IPL treatments. Some good, some, not so good...

However, there are a few precautions we can take to minimise bad results:

- 1. Select your patients/clients carefully. Not everyone is suitable for these treatments. Only choose the most appropriate people. Check their medications and whether these may be contraindicated!**
- 2. Choose the correct treatment - this might sound a bit odd, but an American study showed that in up to 40% of cases, the 'wrong' laser was chosen!**
- 3. Be sure to choose the correct settings on your laser/IPL. Many techs are not quite sure how to set up their equipment properly. If you don't know, then seek more information from your supplier or find more detailed training.**
- 4. Emphasize the importance of post-treatment instructions with your patients/clients. Many simply don't listen! Give them written instructions and 'remind' them after every session. Give them suitable aftercare products, if required.**
- 5. Make sure your patients/clients are aware of environmental hazards such as excess sun exposure, 'dirty' locations (including swimming baths, saunas etc) and sweaty excercises!**

These are only a few of the issues which must be considered when treating people with lasers and IPLs.

Mike Murphy has been investigating laser-tissue processes and treatments since 1986. He has published many peer-reviewed papers, articles and books on various topics including the removal of hair, tattoos, blood vessels, pigmentation using lasers and IPL systems.

He continues to research all of these areas and still presents his work at international medical laser conferences.

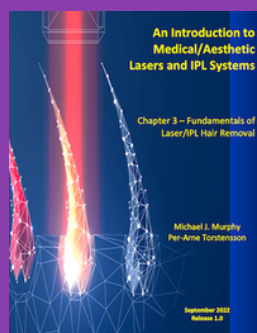
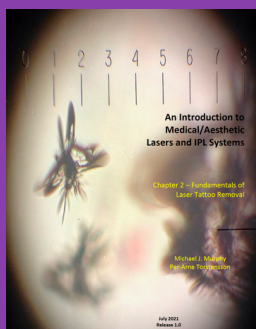
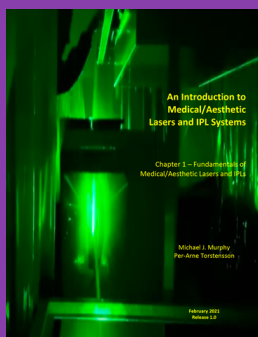
He has published three books on this subject:

An Introduction to Medical/Aesthetic Lasers and IPL Systems

An Introduction to Laser Tattoo Removal

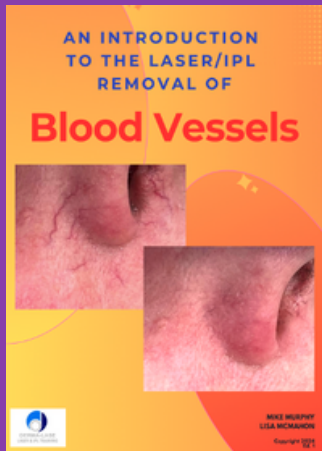
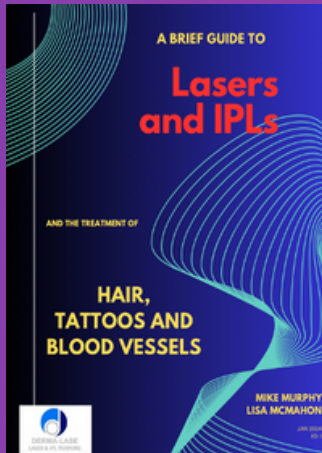
An Introduction to Laser/IPL Hair Removal

You can find his blog at 'MikeMurphyBlog.com'



www.DermaLaseTraining.com

Other booklets by Mike Murphy:



Go to my blog to download these booklets
at [MikeMurphyBlog.com](https://mikeMurphyBlog.com)