

Fotona's  
StarWalker  
MaQX:  
Re-defining  
the Laser  
Alphabet

Non-invasive Laser  
Treatment Methods  
on the Rise

Dynamis Pro:  
It Takes Two  
to Tango

04  
January, 2017



## Exciting new world



**Dr. Masa Gorsic Krisper**  
Head of the LA&HA Institute



**We live in an exciting age in which technology is rapidly changing the world. Predictions say that in less than 10 years, autonomous cars will be a commonly available mode of transportation and 3D-printed houses will be a familiar sight.**

There is no question that the medical world is also undergoing rapid changes. The more that scientists have succeeded in the goal of improving peoples' lives, the more the expectations of patients have increased even higher. They seek and expect excellent results, and demand procedures with little or no down-time. The numbers in aesthetics alone are fascinating: according to Medical Insight, the total number of global aesthetics treatments reached 59 million in 2015. Over 7.5 million skin tightening and body shaping procedures were performed in the same year. Moreover, the body shaping market is growing by 14% per year and non-surgical fat reduction by 42% a year. In addition to aging-related factors, recent studies show that the number of people suffering from tattoo regret rose from 14% to 23%.

Laser systems are now becoming an indispensable tool in the daily life of doctors. As with all devices we depend on daily, it's quality that matters the most to users. This is what Fotona aims for - quality that goes hand in hand with ease of use, wrapped in the world's best technology. The latest Fotona laser system, StarWalker MaQX, represents the next important evolutionary step forward in laser technology and design, according to Dr. Matjaz Lukac, CEO of Fotona in our LA&HA interview. He describes it as a powerful but friendly wizard, helping the clinician to work with virtually zero risk of error. In this issue of the LA&HA magazine, we present more insights into recent trends and novelties, as well as in-depth articles and clinical cases. Because sharing knowledge is what we passionately believe in, we also pursue this mission through our new LA&HA Institute - a modern facility designed for continuous training and education on the safe and effective use of lasers in medicine and dentistry. What's more, the LA&HA Institute is also actively involved with research into new applications and organizing professional events for the exchange of scientific information.

Welcome to an exciting new world of laser education!

# Fotona workshops at the LA&HA Institute

Improve your knowledge and skills with medical lasers in a new state-of-the-art laser research and training facility.

Comprehensive 1-3 day workshops and tailor-made training courses are available in the following fields:

- Aesthetics & Dermatology
- Surgery
- Gynecology
- Dentistry

Experience a unique opportunity to interact and share experiences, ideas, and expertise in a professional, highly advanced and relaxed environment.

For registration and more details please visit:  
<http://www.fotona.com/en/workshops/>

For more information contact:  
[trainings@fotona.com](mailto:trainings@fotona.com)



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A close-up photograph of a woman with vibrant teal hair and colorful tattoos on her arms. She is looking down and to the side with a thoughtful expression. The background is blurred, suggesting an outdoor setting. The word "TRENDS" is overlaid in large white letters across the middle of the image.

# TRENDS

By Dr. Masa Gorsic  
Krisper  
**Americans spend \$40 billion per year on weight-loss programs and products, with as much as 91% of women saying they wish to change their body. Non-invasive body shaping is a major technological breakthrough that's been making huge inroads into an already flourishing aesthetics market.**

# Non-invasive Laser Treatment Methods on the Rise

In 2015, the total number of global aesthetics treatments reached 59 million, according to studies by Medical Insight. With the growing preference for minimally invasive and non-invasive aesthetic procedures, as well as rising demand for aesthetic treatments among the male population and rapid growth in the total number of cosmetic procedures, the forecast for the global medical aesthetics market promises further progressive growth, with an annual rate of 11% from 2015 reaching \$12.8 billion by the year 2020.

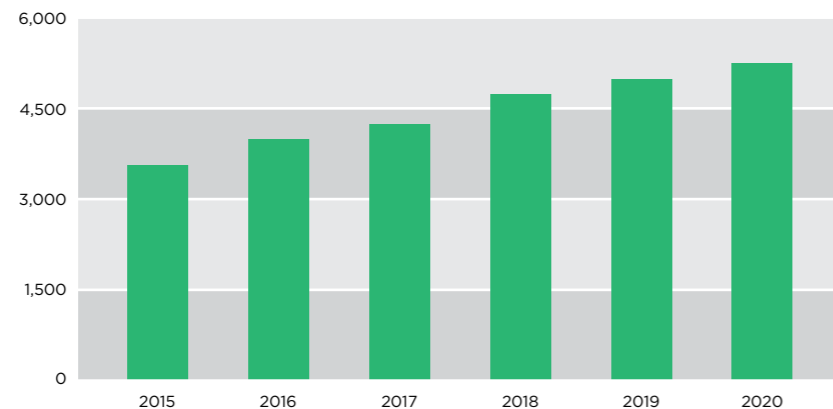
## Men seeking non-invasive fat removal treatments

The development of aesthetic medicine has always been conditioned by the demands of patients, who generally seek better, more minimally invasive procedures with less downtime and minimal cost. The numbers confirm that nonsurgical procedures have enjoyed had an especially enormous rise in the last 20 years. The growth has been mainly due to the rising popularity of non-invasive procedures and new technology options, as well as other significant indicators, such as rising obesity rates, with more than 1.3 billion overweight adults in 2013 (BMI 25-30) looking for easier alternatives to diet and exercise. There is also a greater percentage of men seeking aesthetic treatments. The number of American men undergoing non-invasive body treatments rose by more than 22% annually from 2012 to 2015.

**The body shaping market is growing by 14% per year.**

**Worldwide Procedure fees for Body Shaping & Skin Tightening 2015 - 2020**

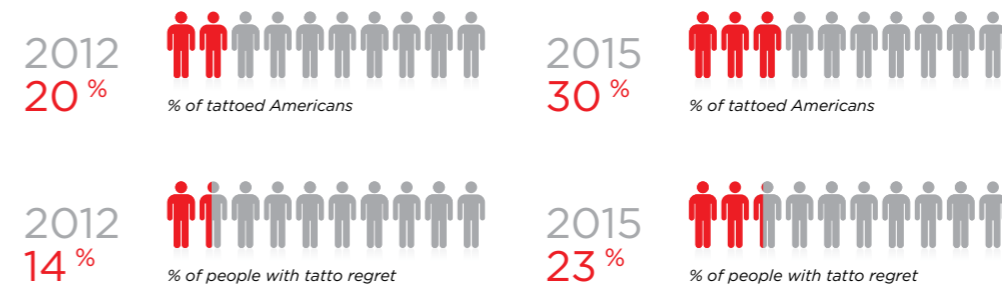
A substantial rise in procedure fees for body shaping and skin tightening is expected by 2020.  
Source: Medical Insight



## One in four regrets their tattoo

Laser treatments for tattoo removal are also rising in popularity. Coinciding with the increased numbers of people getting tattooed - three in ten Americans already have at least one tattoo - there is also a major growth in the number of people seeking tattoo removal. The numbers are fascinating: one in four regrets getting their tattoo. Among the reasons for the removal, clients most frequently mention the loss of the meaning of their tattoo, the art was poorly done, the tattoo was love-associated or they changed their lifestyle. The number of people suffering from tattoo regret went up from 14% in 2012 to 23% this year according to a recent study by The Harris Poll. This has led to flourishing business in tattoo-removal treatments. As IBISworld market research states, the industry has grown 440% in the last decade.

**The tattoo-removal industry has grown 440% in the last decade.**



**Tattooing is still trendy**  
Source: The Harris Poll

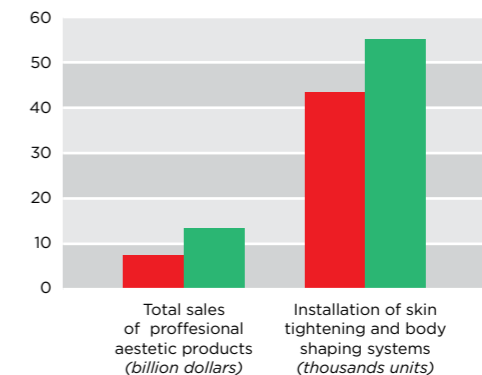
**23% of tattooed Americans are regretting having their tattoos done**  
Source: The Harris Poll

## Asia-Pacific market: the sleeping beauty

The Markets and Markets research report predicted that North America will still hold the lion's share of the global medical aesthetic market by the end of 2016, followed very closely by Europe, with the Asia-Pacific area falling behind with a smaller market share - but an expectation to grow at the highest annual growth rate. This growth is directly affected by a rising number of aesthetic procedures, an expanding middle class with growing purchasing power, medical tourism, and an increasing focus of global players.

Asian and Latin American countries will experience strong growth in the body shaping and skin tightening market, gaining 17.5% per year, followed by Europe with a lower growth of 15.5% and North America with 11.4% per year, as suggested by Medical Insight's studies.

**Practitioners earned 4.1 billion dollars globally from skin tightening and body shaping treatments in 2015.**



**Growth of the aesthetics, skin tightening and body shaping markets.** Source: Medical Insight

By Edita Krajnovic  
and Sasa Gnezda

# Fotona's StarWalker MaQX: Re-defining the Laser Alphabet

**If you think that Fotona has reached its peak in terms of medical laser development, then you haven't seen the company's latest product, StarWalker MaQX. This pioneering device is everything the acclaimed QX MAX was and much more. Don't be fooled by its small footprint, light weight, and silent operation – this is an extremely powerful system. As the finishing touches were just being put on the company's newest star, we talked with the CEO of Fotona, Dr. Matjaz Lukac.**

**Fotona is striking again, this time with StarWalker. What is the essence of this innovative system? What is StarWalkers' ambition?**

Since its introduction, Fotona's QX Max has been globally recognized as an ultra-performance Q-switched laser system. The new StarWalker MaQX represents the next important evolutionary step forward, taking the system to an even higher level. It features everything that has set our QX MAX system apart from the competition, including its patented OP-TOflex optical vacuum cell technology. What's more, StarWalker brings additional new cutting-edge innovations such as the Adaptive Structured Pulse (ASP) power supply and MaQX pulse forming technologies.

StarWalker is a powerful but friendly wizard, helping the clinician to work with basically zero risk of error.

**So the future is here with StarWalker. What are top three novelties StarWalker introduces for clinical practice?**

We say that with StarWalker MaQX Fotona is re-defining the 'laser alphabet'. It is our MaQX technology that enables StarWalker to deliver unprecedented Q-switched energies for the fastest, largest spotsize treatments at infrared and visible wavelengths. What's more, StarWalker MaQX features intelligent software and design in its touchscreen user interface. This is why the system is so easy to use and enables fast user interaction and customization. And if you find other laser systems to be large, heavy and uncomfortably loud, StarWalker will surprise you. It has an extremely small footprint, it is lightweight and silent, and yet immensely powerful.

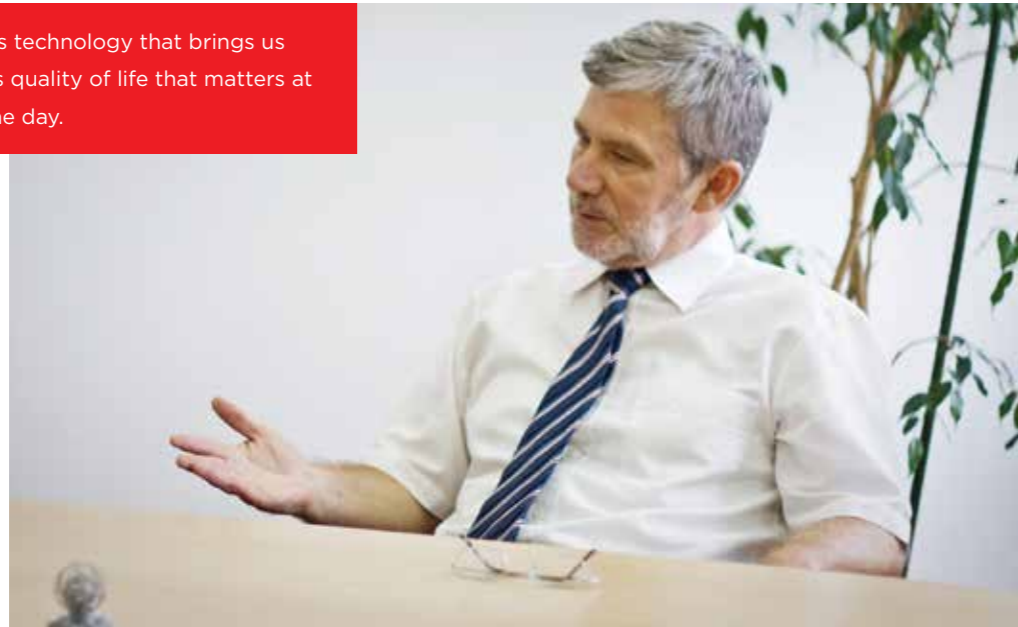
**If StarWalker was a human, an assistant to the clinician, how would you describe its personality and competences?**

It is a powerful but friendly wizard, helping the clinician to work with basically zero risk of error. For example, every aspect of laser-skin interaction is computer controlled, including handpiece spacers, zoom dials, and on-the-fly basic parameter changes with automatic recalibration. StarWalker also comes with a comprehensive treatment log, which makes the 'what parameters did I use the other day?' head scratching moment a thing of the past. And of course, this wizard has 'magical powers' enabled by Fotona's ASP and MaQX innovative technologies. StarWalker enables treatments such as tattoo removal and other skin pigments that cannot be performed with the same safety and efficacy by any other means.

**The design is truly remarkable: how do you combine an advanced, complex laser system in such a simple, user friendly design?**

Whoever walks around a laser exhibition might come to the conclusion that the majority of laser devices are large and clunky looking by necessity. With StarWalker, we are breaking this barrier. StarWalker is extremely powerful, yet sleek and small. Our most advanced technology enabled us to package StarWalker into our Red Dot awarded design. In one sentence: StarWalker MaQX is a beast inside a beauty.

Although it is technology that brings us together, it is quality of life that matters at the end of the day.



**At the 50th anniversary of Fotona, you stated 'The secret to our success is each and every employee's identification with Fotona and its passion for perfection'. How do you achieve such a high level of engagement?**

The most innovative devices, those that are on the edge of what technology today can deliver, usually require high maintenance and servicing. Fotona is changing this paradigm. Our goal is to change the world of medicine by developing ultra-performance laser systems that are also ultra reliable at the same time.

We do not stop at improving the lives of doctors and patients. It is equally important to us that our employees, partners and customers feel appreciated and respected, and that they know they are all members of Fotona's global family. Who is your safety net in this occasionally crazy world? On whom do you rely on the most? On your family! Although it is technology that brings us together, it is quality of life that really matters at the end of the day. This is why we, the Fotona Family, enjoy this common exciting ride of making the world a better place as 'One Family Altogether', as we like to say.

**For more than 50 years, Fotona has been one of the leading developers and producers of innovative laser systems. Looking ahead, what can we expect at the century milestone?**

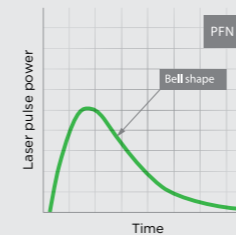
Since its beginning, Fotona has been an active and passionate participant in the exciting development of laser photonics. We were one of the first to realize the potential of laser holography, or of free air laser communication. It was Fotona's technology that enabled the world's first live optical video transmission of TV signals during the Olympic games in 1984. That same year we developed our first medical laser for use in ophthalmology, and then proceeded into dentistry, dermatology, surgery and gynecology. Nobody knows what the future will be like, but I am confident that Fotona will continue to play an important role in enriching global society with our ultra-performance medical devices.

This powerful system is also extremely user-friendly: it has a completely overhauled interface that focuses on fast user interaction, medical applications and customization.

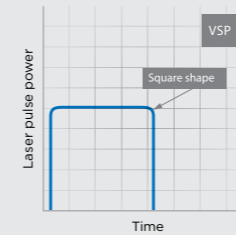
**ASP** POWERED  
New Revolutionary Adaptive Structured Pulse Technology

**ASP - The Third Generation Technology**

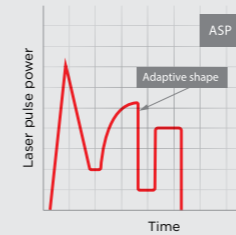
StarWalker™ and its groundbreaking ASP (Adaptive Structured Pulse) technology represent a cosmic shift forward for the medical and aesthetic laser industry. This third-generation technology combines the unsurpassed range of pulse duration modes of Fotona's VSP (Variable Square Pulse) technology with the revolutionary capability of ASP technology to adapt the temporal structure of laser pulses to the bio-photonic dynamics of laser-tissue interaction.



Standard PFN Technology



Fotona VSP Technology



Third Generation Fotona ASP Technology



By Dr. Masa Gorsic Krisper

The Dynamis Pro line combines two complementary laser sources, Er:YAG (2940 nm) and Nd:YAG (1064 nm) together, allowing the system to perform a wide-range of aesthetic, surgical and gynecological applications, making Dynamis Pro a trend setter in minimally invasive and non-invasive aesthetic procedures.

## Dynamis Pro: It Takes Two to Tango

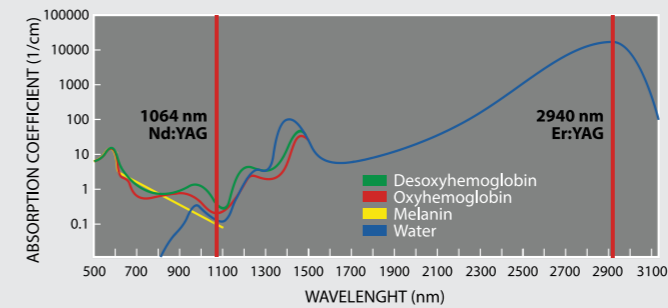
Each laser works in a specialized way – the Nd:YAG wavelength reaches the deepest layers of the skin, while the Er:YAG wavelength erases surface imperfections to create visually significant results that last for an extended period of time.

The Dynamis Pro delivers proven aesthetic treatments, including skin resurfacing & rejuvenation, removal of veins and vascular/pigmented lesions, plus permanent hair reduction and more. With functions ranging from superficial to deep peels, from non-ablative to fully ablative and from full-field to fractional resurfacing, treatments can be tailored to any specific skin condition to achieve exceptional results.

The superiority and versatility of the Dynamis Pro has been recognized by THE Aesthetic Industry Awards. In 2015 Dynamis Pro was chosen as the best multi-use energy based device.

### The winning combination

The SP Dynamis' VSP (variable Square Pulse) ER:YAG laser inherently ablates skin more precisely than other laser technologies. Er:YAG energy is highly absorbed in water – the main target chromophore for skin resurfacing – and can thus vaporize skin with micron-precision and very little thermal conduction. This keeps undesired effects such as hypopigmentation and persistent erythema, as well as recovery time, to a minimum. The Er:YAG laser in SP Dynamis systems can be accurately tuned from varying “cold” and “hot” ablative to non-ablative thermal ratios. Full customizability allows you to precisely attain the clinical outcomes your patients desire. The Nd:YAG laser perfectly complements the Er:YAG lasers's ablative action with its ability to penetrate deeply into the skin to create thermal effects without damaging the skin surface. Its homogeneous absorption in the skin and low absorption in melanin allow it to be safely used in all skin types. Compared to conventional technologies, the Nd:YAG pulses of SP Dynamis lasers create virtually instantaneous FRAC3® temperature increases, limited to the targeted structures only. No unnecessary energy is deposited into the skin.



### Key treatments with Fotona SP Dynamis:

- Non-ablative Skin Rejuvenation
- Ablative Skin Rejuvenation
- Skin Resurfacing
- Full Beam & Fractional Treatments
- 4D
- Tight Sculpting
- Hair Removal
- Pigmented Lesions
- Vascular Lesions
- Acne & Acne Scar Revision
- Scar Revision
- Onychomycosis
- Warts
- Benign Lesions Removal
- Surgical Applications: Laser Lipolysis, EVLA, Hyperhidrosis

### Dynamis Pro sets a trend in facial rejuvenation

Dynamis Pro not only follows, but is also setting trends in minimally invasive and non-invasive aesthetic procedures. One of the most impressive capabilities of the Dynamis Pro has been the results achieved with new non-invasive procedures for rejuvenation and body-contouring. The Fotona4D® and TightSculpting® treatments use a unique combination of propriety technologies based on Fotona's SMOOTH™ mode (long-pulse Er:YAG) and PIANO® mode (long-pulse Nd:YAG), resulting in an incredibly efficacious, powerful treatment, which according to experts is unrivaled when it comes to facial rejuvenation, fat reduction & skin tightening.



**Fotona4D®: The four dimensions of anti-aging**

Fotona4D® is a series of synergistic, non-invasive laser treatments of both the exterior facial and interior oral cavity, enabling full-thickness contraction of collagen for persistent tightening and volumization without injectables.

With two laser wavelengths, Er:YAG and Nd:YAG, and four treatment modes, anti-aging is comprehensively approached from four different levels, working on deeper, medial and superficial connective structures of the skin, as well as targeting imperfections in a painless and effective way.

The four “dimensions” of Fotona4D® refer to four distinct treatments with the Dynamis Pro system: SmoothLiftin™, FRAC3®, PIANO® and SupErficial™, all harnessed in concert to combat facial aging, with little or no downtime or anesthesia. It tackles problems of laxity around the mouth and jowls which most other systems or surgery find difficulty to address. This is a relative painless procedure with no downtime that can be performed all year-round.

1. The first step is SmoothLiftin™, a revolutionary non-ablative Er:YAG intraoral treatment using SMOOTH™ mode pulses for controlled and gentle “bulk-heating” to stimulate collagen contraction and improve tightness and elasticity in the treated tissue.



**SmoothTouch LA adapter**

Fotona has developed a new SmoothTouch (LA) glass adapter with 90-degree, gold-mirror reflection of the laser beam for easier and more comfortable application of intraoral treatments:

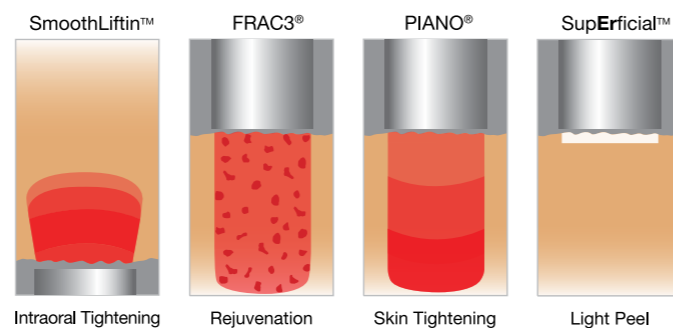
- Er:YAG adapter for SMOOTH mode intraoral treatments
- applicable to PS03 and R11 handpieces
- for safe and easy treatments
- greater comfort for patients

2. The second step is FRAC3®, a self-induced, fractional effect of the Nd:YAG laser and a specific pulse structure that generates tiny regional spikes of high temperature, helping to treat specific, deeper imperfections and restore youthful skin texture.

3. The third step is PIANO®, a unique, ultra-long Nd:YAG pulse mode that causes bulk tissue heating safely and rapidly, from the outside in, by concentrating energy delivery subcutaneously.

4. Finally, the SupErficial™ component refers to a cold Er:YAG ablation that gives a pearl finish to the skin. Using propriety Variable Square Pulse (VSP) technology, the laser delivers a controlled light peel, without thermal effects, for a no-down time, precise treatment.

**Fotona4D®**  
Non-invasive laser face lifting



**Two steps for ideal TightSculpting™**

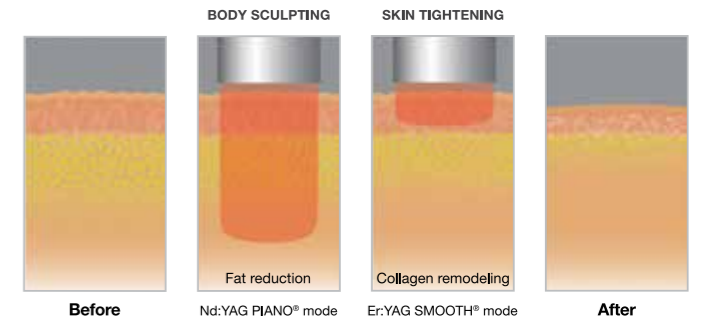
**1st step: Deep skin tightening and fat reduction with PIANO® pulse**

The first stage of TightSculpting™ consists of a special Nd:YAG pulse mode designed for homogenous tissue heating comfortably, safely and rapidly, by concentrating energy delivery to subcutaneously stimulate the metabolism of fat cells, leaving the epidermis intact. PIANO® mode extends the pulse duration to the seconds regime, resulting in full-thickness bulk heating with an overall synergistic tightening effect.

**TightSculpting™**  
LASER BODY SCULPTING AND SKIN TIGHTENING

**2nd step: Improvement of skin surface laxity with SMOOTH® pulse**

The second stage consists of non-ablative Er:YAG SMOOTH® mode, ideal for skin tightening. The intense, controlled surface tissue heating stimulates collagen remodeling and initiates neocollagenesis. The effects result in an overall improvement of laxity and elasticity in the treatment areas.



**High performance accessories for faster and more precise treatments**

Fotona’s innovative MatrixView™ temperature monitor ensures effective and controlled treatments for ultimate patient comfort and safety. Two scanners were developed for simultaneous, large-body-area treatments using adjustable scanner-area shapes and sizes, enabling maximum efficiency with each procedure. The L-Runner Nd:YAG scanner with MatrixView temperature sensor covers 62,5 cm2 with a maximum 11 mm spot size, enabling very quick, uniform coverage of large areas of the body. The T-Runner Er:YAG scanner provides rapid delivery of SMOOTH™ mode pulses, covering 62,5 cm². Combining both scanners and MatrixView are a winning combination, allowing a practitioners to perform procedures with extreme speed, safety and ease of use.



**L-Runner**

- Nd:YAG scanner with MatrixView – a new tool for optimal deep tissue heating with real-time temperature measurement
- High pulse rates for enhanced speed
- Computer-controlled scanning of up to 62.5 cm²
- VERSA, FRAC3, PIANO modes

**T-Runner**

- Er:YAG scanner for optimal collagen remodeling and skin tightening
- High pulse rates for enhanced speed
- Computer-controlled scanning of up to 62.5 cm²
- SMOOTH mode



Combining both scanners and MatrixView are a winning combination, allowing a practitioners to perform procedures with extreme speed, safety and ease of use.

By Matjaz  
Kljajic

## The LA&HA Institute: the “living room” of the Fotona family house



**Music school is where one goes to learn how to play a musical instrument. But where does one learn how to operate a complex device such as a medical laser?**

**“Lasers are like a living being and one has to learn how to work with them” explains Dr. Masa Gorsic Krisper, head of the new LA&HA Institute. The best place to educate yourself is at one of the most advanced institutes in the world, located right next door to Fotona’s European headquarters.**

### **Dr. Gorsic Krisper, how was the idea of the LA&HA Institute conceived?**

The seed for this magnificent facility was planted in 2007 when the Laser and Health Academy (LA&HA) was born. Since day one, LA&HA’s mission has been to support innovation, development and education through workshops designed to improve the knowledge and skills of Fotona laser users. Throughout the years, the activities of LA&HA expanded enormously. In order to continue to improve the quality of our services, we had to expand our activities and invest in a new laser training and research center.

### **What knowledge and experiences do clinicians obtain from the Institute?**

As a doctor from Norway said: “If you have a Rolls Royce in your garage, you absolutely need a driving license.” Continuous training and education on the effective and safe usage of lasers in medicine and dentistry are a must. Users recognize the benefits of having both theoretical and practical training on medical laser technology in one place. The Institute offers numerous possibilities: we can lead simultaneous workshops, educate large groups of up to 100 participants, with each having – with the help of live video transmission from the laser room to the lecture room – equal access to observe live procedures up-close. But hands-on experience is equally important, so all participants also have the chance to work with the lasers themselves. Besides all this, the LA&HA Institute is a place for continued research on new applications, as well as organized meetings for the exchange of ideas and practices.

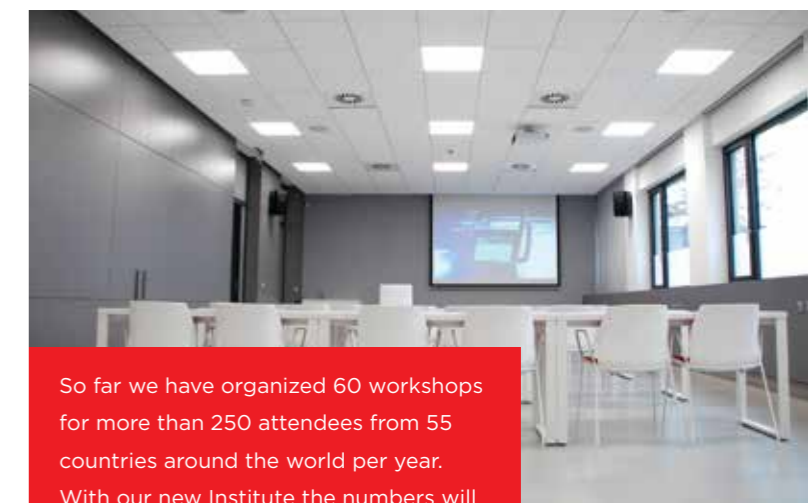
### **Who are the attendees of LA&HA Institute trainings and events?**

In the past we have organized 60 workshops for more than 250 attendees from 55 countries around the world. This number stands for our ‘old’ facilities, and now, with our modern Institute we expect the numbers to grow immense-

ly. Living proof that we are doing a good job is that we have many repeat clients, including one clinician who came to our workshops more than 5 times!

### **What thoughts went into the architecture and the design of the training center?**

Our goal was to place the world’s best-made and highest-performance laser devices in the type of environment they truly deserve – a beautiful, modern and futuristic institute incorporating modern architectural design, and to fulfill all of the special requirements of this type of working environment.



So far we have organized 60 workshops for more than 250 attendees from 55 countries around the world per year. With our new Institute the numbers will increase.

If you have a Rolls Royce in a garage, you need to get the driving license. This is what we do: educate you for using our laser systems.



**What differentiates the LA&HA Institute from other similar institutions?**

We see the Institute playing a key role in supporting LA&HA's mission, which is to serve as a global platform for the exchange of knowledge among peers and the promotion of evidence-based laser medicine and dentistry among practitioners and the general public. The Institute offers access to the latest innovations in lasers, laser handpieces and applications, in a

modern and at the same time welcoming environment. The workshops and research are led by highly educated and experienced staff. At the Institute's official opening, many attendees said that it's the most state-of-the-art laser facility they have ever seen. We are positive that the majority of Fotona users are starting to feel our 'One family together' moto. I personally see the LA&HA Institute as the 'living room' of our big Fotona family house.



Laser body sculpting and skin tightening  
**TightSculpting™**

taking aesthetic procedures to a new dimension.

**Dual-wavelength** laser procedure combining unique **PIANO®** and **SMOOTH®** technologies for deep as well as superficial skin tightening and fat reduction.



**Dynamis**  
Multi-Application  
Laser System

[www.fotona.com](http://www.fotona.com)

To learn more about TightSculpting™ and what the SP Dynamis can do for your practice contact Fotona at [info@fotona.com](mailto:info@fotona.com) today.

Committed to designing, manufacturing and delivering:

**The Highest Performance, Best Made Laser Systems in the World**



**EXPERTS**

By Edita Krajnovic

**An interview with Leonardo Marini, medical director of The Skin Doctors' Center of Trieste, Italy, and the chairman of the Task Force for Laser Dermatology of the European Academy of Dermatology**

**About Leonardo Marini**

Dr. Marini concluded his training as a general surgeon in 1987 and as dermatologist in 1989. He is currently the medical director of SDC – The Skin Doctors' Center of Trieste, Italy and has served as professor of laser dermatology at the University of Siena, Parma, and Verona. Dr. Marini is the chairman of the task force for laser dermatology of the European Academy of Dermatology. He has proudly served as founder president of ESLD – the European Society of Dermatology, established in Trieste in 1996, and as president of ESCAD – the European Society of Aesthetic and Cosmetic Dermatology. He has published numerous scientific peer-reviewed papers in international medical journals as well as many book chapters and delivered more than 400 clinical presentations at international congresses and scientific meetings.



**“StarWalker will be the highlight of the light-based technologies”**

**From a doctor's perspective, what are the unique advantages of lasers in dermatology practice?**

Lasers have always attracted dermatologists because of their ability to be independent from direct skin contact. The idea of treating skin alterations with a beam of light, whether visible or not, was also very welcomed by patients. Bypassing superficial skin layers and coagulating deep dermal structures like capillaries and venules was incredible in the eyes of many physicians. Reaching difficult anatomical regions and treating them without the need of physically 'touching' them is clearly another advantage offered by laser technology.

**What are your main applications with the Q-switched laser, and which system do you currently use?**

Advanced Q-switched laser tattoo removal is quite popular now, due to the increasing number of people willing to remove their permanent skin markings. Tattoos are increasing among young populations around the world and it is estimated that roughly 65% of individuals are willing or strongly considering to have a tattoo. Many people nevertheless regret having a tattoo on their skin and wish to have them removed. Besides tattoo pigment removal with our innovative multilayer technique, we successfully use our Q-switched laser system to treat eyelid

I cannot wait to have a StarWalker at the Skin Doctors' Center - it will be the highlight of the light-based technologies to be offered to my patients.

xanthelasma, sebaceous nevi, sebaceous hyperplasia, solar keratosis. Treatments are fast and recovery time well accepted. I have found the QX MAX system from Fotona to be truly a fantastic system: compact, reliable, powerful, and extremely effective. I really like to work with it also from the ergonomic point of view, not of secondary importance for a laser surgeon.

**Are you excited about StarWalker, the new Fotona QS laser? What do you expect from it?**

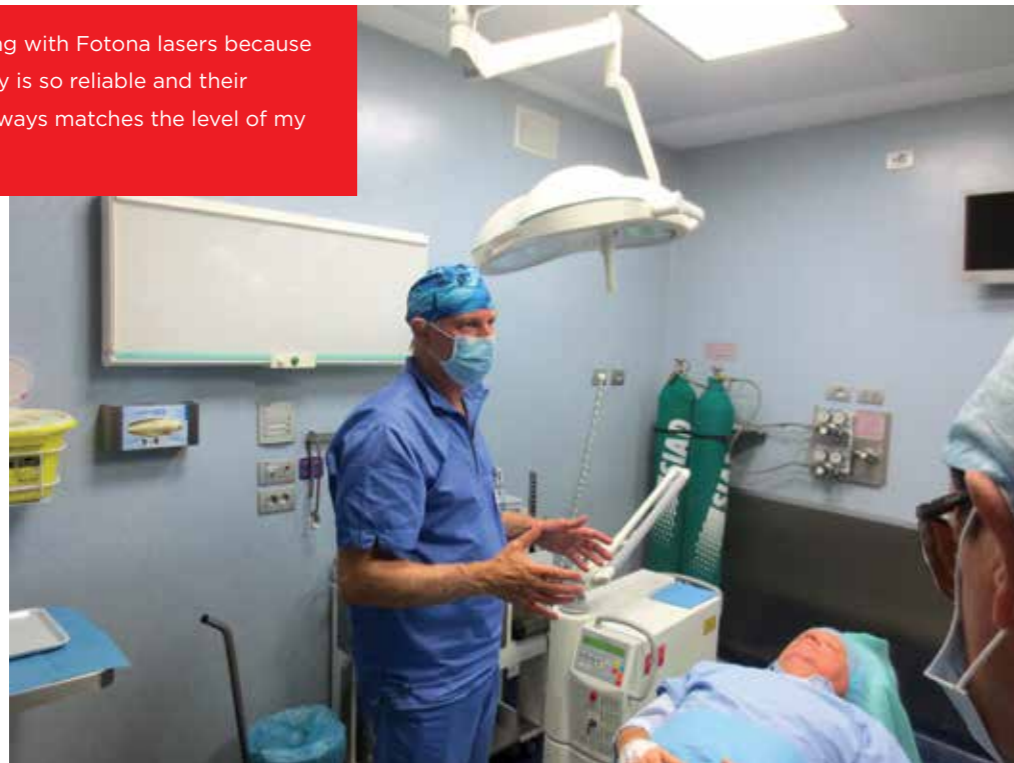
Since hearing the first news regarding the development of a new Fotona QS laser system, I was extremely excited. If, with the original QX MAX, I was able to obtain such impressive clinical results, it was hard for me to imagine what Fotona could have developed better. I am really excited to work with the new super-powerful Fotona QS platform, which, already from its name, promises stellar results and universal technical performance. I cannot wait to have a StarWalker at the Skin Doctors' Center - it will be the highlight of the light-based technologies to be offered to my patients. I am sure StarWalker will also provide some interesting inspirations to develop innovative new QS applications. 2017 will surely be the StarWalker year!

**You perform many different combined treatments? Which are the most popular combinations?**

I always loved to combine different laser systems and many other technologies, to the point that my friend Merete Haedersdal, a very famous Danish laser dermatologist calls me 'Mr Combo'. I am not joking when I say that the concept of sequentially layering many different lasers during the same procedure does make a major

difference in comparison with a single-laser procedure. You can optimize each laser's specific possibilities and minimize possible complications and side effects. Recently I proposed an innovative multilayer fractional and conventional QS laser procedure to optimize tattoo pigment removal, which is gaining quite considerable popularity among our tattoo patients.

I do love working with Fotona lasers because their technology is so reliable and their performance always matches the level of my expectations.



**Can you tell us more about the combined treatment for tattoo removal?**

Conventional QS laser intradermal pigment removal consists of a single laser pass per session inducing a very slow, progressive pigment clearing requiring an average 10-12 sessions for professional tattoos. Treatments should be spaced at least 2-3 months to avoid complications and side effects. Modern technologies and innovative multilayer treatments allow for a significant decrease in the number of treatments, making tattoo removal more appealing to potential patients. We were able to reduce tattoo removal time down to 3-5 treatment sessions by combining 2094 nm fractional Er:YAG laser 'priming' followed by 2-3 passes of conventional QS laser super-selective pigment removal, spaced 5 minutes apart. This innovative fractional priming technique allows

the immediate escape of subdermal gas bubbles usually produced immediately after QS laser passes, opening the way to a subsequent immediate conventional QS laser pass.

Presently, an innovative fractional handpiece is being developed by Fotona for the Q-switched laser called FracTAT, which is substituting for the fractional Er:YAG priming exceptionally well. I do love working with Fotona lasers because their technology is so reliable and their performance always matches the level of my expectations, which are not 'low'. The vast number of accessories and the continuous innovations Fotona constantly develops contribute to keeping its laser systems always at the top, giving them a very long technical life, not bad during these times of economic crisis.

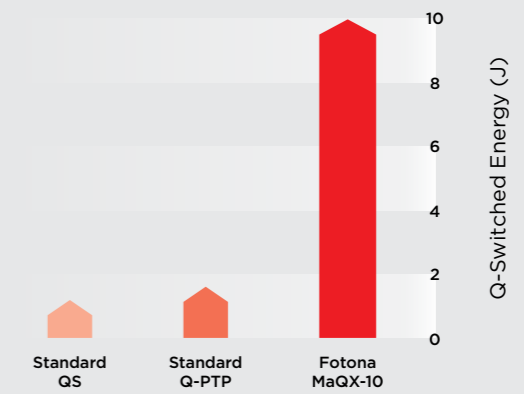


**StarWalker's MaQX - Unmatched Q-Switched Pulse Energy**

Fotona's StarWalker laser system features the entire range of super-short pulse technologies in a single, high-performance solution. StarWalker's patented MaQX pulse modalities produce powerful bursts of laser energy that photo-acoustically break apart skin pigmentations into smaller, more easily eliminated particles.

Based on revolutionary ASP technology, StarWalker is capable of delivering up to an unprecedented 10 J of Q-switched energy in one giant structured MaQX pulse.

The unique MaQX high energy capability of StarWalker enables the generation of a higher energy photoacoustic effect at the treatment site, leading to more effective and faster treatments. Additionally, with high MaQX energies, larger spotsizes can be used resulting in more homogeneous treatments of even deeper lying skin pigments, and therefore with reduced risk of unwanted side effects.



Patient safety and comfort with ultra-performance MaQX mode treatments are further enhanced by the StarWalker's unique capability that allows the user to select the softness level (MaQX-1, MaQX-2, MaQX-5 or MaQX-10) of the treatment.

The MaQX mode is also ideal for proprietary FracTAT fractional Q-switch treatments with StarWalker.

By Anisa Faganelj **An interview with Ashraf Badawi, certified dermatologist and lecturer in the National Institute of Laser Enhanced Sciences, Cairo University in Egypt.**

**About Ashraf Badawi**

With two PhD degrees in clinical medical sciences and laser applications in dermatology, a master degree in dermatology and a diploma in laser application in biology and medicine, Dr Ashraf Badawi is one of the leading experts in cosmetic dermatology worldwide. He is currently certified dermatologist and lecturer in the National Institute of Laser Enhanced Sciences, Cairo University, Egypt, and a visiting lecturer in Szeged University, Hungary. He has over 15 years of experience in rejuvenation, treatment of photo damage, laser treatment of unwanted tattoos and unwanted hair reduction and has participated in over 100 international specialized conferences as a speaker and chairperson and has participated in providing training for over 1,500 practitioners in the field of cosmetic dermatology all over the world.



**“A few technologies can provide a ‘no downtime’ treatment with quickly visible results”**

The SP Dynamis is my favourite: no other laser machine in the market can deliver the same outcome with a single device.

**Which method of rejuvenation do you prefer?**

This is really not a question for me, it is for the patient. We are living in a very dynamic world. Most people are working and cannot afford downtime, so most of my patients indeed prefer a treatment with minimal or no down time, yet they want to see results quickly. Only a few technologies in the market can provide that. Non-ablative rejuvenation is usually the answer, provided it can deliver real results.

**Do you combine different laser wavelengths for optimal effects?**

Sure, combination treatments are the only way we can achieve good results with non-ablative techniques. Sometimes it is not only a combination of wavelengths, but also a combination of procedures that is

PIANO is a very unique feature. Besides an efficient skin tightening or non-invasive lipolysis it also play an important role in pain management too.

required. For example, I occasionally combine microdermabrasion with 2940 nm Er:YAG and the 1064 nm Nd:YAG in the same session to be able to induce epidermal barrier function repair, skin tightening and collagen stimulation.

**What do you think about Fotona’s propriety PIANO® technology?**

PIANO is a very unique feature which is not available in any other Nd:YAG laser in the market. Its effect is not just limited to efficient skin tightening or non-invasive lipolysis – it also plays an important role in pain management too. It’s a very unique feature, which I thank Fotona for developing.

**Do you use the Fotona4D® treatment for rejuvenation?**

4D is a popular procedure in my practice, however, not every patient needs it. Depending on the problems and the issues the patient is having, we design the appropriate treatment plan. Dealing with the epidermis is a must for every single patient. Using either microdermabrasion

or superficial Erbium peel depends on 2 main factors: the status of the epidermis and the willingness of the patient to come back several times, versus fewer visits with slight erythema for a day or two. Then we need to evaluate the skin laxity. If there is skin laxity, we need to tighten the skin. If the skin laxity involves the nasolabial lines, then Fotona SMOOTH is required for intraoral tightening, followed by PIANO mode on the cheeks and the neck. If the nasolabial lines are not involved but there is face and neck laxity, then PIANO will be used alone for the face and neck. Finally, depending on the collagen impairment, which is reflected in the skin by roughness, large pores and wrinkles,

FRAC3 might be required as a method of Collagen Induction Therapy (CIT). This allows us to improve all the aspects of the skin in a very professional manner, thanks to the unique technology of Fotona’s SP Dynamis laser.

**Why is your overall opinion of the SP Dynamis?**

The SP Dynamis is truly my favourite, as no other laser machine in the market can deliver the same outcome with a single device.

**Where do you see the future of rejuvenation techniques?**

I think that the general awareness is increasing about the possibility of delaying the signs of skin ageing. The future will see anti-aging treatments in which patients have a course of treatments over 3-6 months and then continue to be treated 3-4 times per year, so that they keep their skin in a good shape without the need for aggressive procedures associated with down time and complications. Luckily, we can do that with a proper understanding of the skin aging process and with the help of high quality technologies such as those provided by Fotona.

By Sasa Gnezda **An interview with Adele Bartram Goodall, the Practice Manager of Body Recon Cosmetic Clinic and Plastic Surgery**

**About Adele Bartram Goodall**

Adele Bartram Goodall received her medical laser training from the Fleming Laser Institute in Melbourne Australia in 2007. She is the Practice Manager of Body Recon Cosmetic Clinic and Plastic Surgery, where she works alongside Plastic and Reconstructive Surgeon Dr. Richard Rahdon as a Senior Dermal Clinician specializing in medical laser treatments of skin rejuvenation, vascular and pigment removal, caring for patients and clients pre- and post-operatively. Working with Dr. Rahdon, her expertise includes understanding and advising patients on cosmetic surgical procedures and assisting with cosmetic consulting such as breast surgery, abdominoplasty, facial rejuvenation and skin lesions.



**“Fotona lasers are like Lamborghini: the very best in the world”**

Fotona lasers allow me the freedom to tailor treatments to each individual patient to achieve the best result and outcome for them.

**When did you first start using a Fotona laser?**

We were the first clinic in Australia to have Fotona’s QX MAX and SP Dynamis lasers, which was 5 years ago. At the time we knew very little about Fotona but were told how fabulous their technology, engineering and protocols were. Once I began working with our Fotona lasers I was so impressed, I often describe it to patients as driving a Lamborghini – it’s the very best in the world. It’s also allowed us to grow our business and offer the most effective and safest treatments to all of our patients. I love that Fotona continues to evolve and develop new technologies and protocols

The Fotona systems we work with have no consumables, which ensures high revenue for our business and a lower environmental impact.

to always remain an industry leader. We have recently just purchased our third Fotona system, another SP Dynamis.

**Which applications do you use with Fotona’s Q-switched laser?**

I use Q-switch predominantly for pigmented lesions, tattoo removal and skin rejuvenation. After working with the system for a few months I saw a demand for patients seeking quicker results. So I began combining Q-switched Nd:YAG and Q-switched KTP to remove and fade pigmentation quicker than a standalone modality, but still in a non-ablative method. I shared my experiences with Zdenko Vizintin on one of his visits to Australia, and he was suitably impressed with our results. We named the protocol Green Toning as patients also can experience added improvement in texture and tone of the skin. The combined method showed much better and quicker result than a standalone modality and was still very safe to treat all skin types, all year around (as our practice is in coastal Australia). It was also much more

effective for treating melasma and dermal pigmentation as patients were more willing to continue treatment after seeing improvements in the first few sessions. With KTP having a high absorbency to haemoglobin, it was also helping with the inflammatory effect we see with melasma and other inflammatory pigmentation conditions. For tattoo removal we apply a similar protocol to Professor Marini’s R5 method,

which combines a deep Er:YAG fractional treatment with two consecutive Q-switch Nd:YAG laser passes, using 5 minutes of cold compress with ice-packs between each pass.

This has proved to be very effective and very rewarding. I also use the dye handpieces for the QX MAX which allows me to effectively treat all colours.

**Which are the most popular applications among your clients?**

Because our clinic is a plastic surgery practice, the majority of our work is aesthetics and dermatology based. The main concerns of our patients are anti-ageing, solar damage and vascular abnormalities. Most of my work is skin rejuvenation such as Fotona4D®, TwinLight®, Green Toning, and vascular and tattoo removal. We also offer hair removal, injectable treatments, chemical peels and an array of plastic and reconstructive surgery procedures. I believe that lasers complement other treatments we offer, providing the highest level of service. For example, scar revision following cosmetic surgery, skin rejuvenation following injectables and facial surgery, and even tattoo removal for breast reconstruction patients following radiation therapy, amongst many others.





**Why do you like Fotona lasers?**

They allow me the freedom to tailor treatments to each individual patient to achieve the best result and outcome for them. I really resonate with the “artistry in laser” promotional concept that Fotona uses with their systems. I can tailor the wavelength, fluence, spot size, pulse duration and frequency with every treatment to provide the highest level of efficacy for every skin type and concern. I also really appreciate their continued improvement and development of new handpieces, technology and protocols. They also provide fabulous support with the new LA&HA training centers as well as access to highly reputable and experienced physicians using their lasers. The other users always inspire me to emulate what they are achieving internationally. The Fotona systems we work with also have no consumables, which ensures high revenue for our business and a lower environmental impact.

**Have you developed any new application with Q-switch laser?**

We are continually developing ways we can streamline our protocols by trialing new applications, combining modalities and tweaking current treatment settings. The main new application I have been working on is a treatment I call Tightening and Lightening which is combining the Green Toning with PIANO and SMOOTH modes. My patients love it as there is no downtime, but it addresses both pigmentation and skin laxity, which are two of the main concerns at our clinic. We are also continuing to try and make our tattoo removal treatments more effective. The new modality I have been trialing is with longer pulse durations using the F-Runner prior to the Q-switch to see a comparison to shorter pulse durations and to see if by heating the pigment, we can create a better removal. Obviously correct patient selection is very important and longer pulses should only be used on lower Fitzpatrick skin types.

# The Medical Power of Light



## StarWalker MaQX Ultra Performance Q-Switched Laser System

# Laser Removal of Pigmented Lesions

**A fast, simple and minimally  
invasive Tx**

- Safe and effective procedure
- Minimal recovery times
- Suitable for all skin types
- No scalpel, no sutures
- Controlled, accurate and precise
- Exceptionally well-tolerated by patients

By Sasa Gnezda **An interview with Cho Yu-Li, MD, President of Dr. Angela Skin & Beauty Clinic**

**About Cho Yu-Li**

*Dr. Cho Yu-Li is the President of the Dr. Angela Skin & Beauty Clinic in Taipei, Taiwan. She received her MD degree from the College of Medicine at the National Yang-Ming University in Taiwan, where she also subsequently worked as an Assistant Professor in the Department of Dermatology. Her professional experience also includes serving as an Attending Physician in the Department of Dermatology at the Veterans General Hospital in Taipei, as well as the Chief of the Aesthetic Laser Center at the Schmidt Clinics in Taiwan. Dr. Cho Yu-Li is a member of the Taiwanese Dermatological Association, the Laser & Photonic Medicine Society of the R.O.C., the Taiwan Society of Aesthetic Plastic Surgery, and the American Academy of Dermatology.*



**“A good laser system for daily use, with great performance”**

I have treated around 1000 patients with QX MAX up to now, with satisfying results in pigment removal and skin rejuvenation.

**When did you first start using a Fotona laser, and where were you introduced to it?**

I started using a Fotona “Fidelis” laser in 2003 when I managed my own clinic. At that time I was looking for a reliable and effective laser system for skin resurfacing and benign skin-tumor removal. The Fotona team in Taiwan convinced me that Fidelis was a good choice. The truth is I’m satisfied with it. Last year, the Fotona team in Taiwan introduced me to the QX MAX and its fractional handpieces. I have treated around 1000 patients with QX MAX up to now, with satisfying results in pigment removal and skin rejuvenation.

**For which applications do you use Q-switched laser?**

I use QX MAX on pigmentation, PIH, acne scars, redness, rejuvenation, large pores, melasma, and tattoo.

**What do you like about Fotona lasers?**

Laser systems from Fotona are exceptionally reliable and stable, with satisfying treatment results. It is a good laser system for daily use, with great performance. It makes an excellent investment for doctors who start a new clinic.

**Have you developed any new applications with Q-switched laser?**

I use ACC mode to treat large pores and the results are really impressive. Marked pore size reduction can be seen the next day and the effect can last for at least two weeks. I also use fractional handpieces for skin rejuvenation. Skin whitening and texture improvement is quite good and satisfying!

**Why is Q-switched laser good for darker skin types?**

Nanosecond (ns) pulses generated by Q-switched systems are substantially shorter than the 10 to 100 ns thermal relaxation time of melanosomes, so it’s the safest means for treating patients of darker skin types.

**What trends of Q-switch laser treatments do you foresee in the upcoming years?**

I think the main trend in Q-switched laser treatments will be the implementation of non-ablative fractional Q-switched laser. Gentle treatments with very short down time and reliable results in terms of pigment removal and skin rejuvenation will make it more attractive to both patients and doctors.

Laser systems from Fotona are an excellent investment for doctors who start a new clinic.

By Matjaz Kljajic **An interview with Dr. Nasrin Mani, the founder of the La Jolla Cosmetic Laser Clinic**

**About Nasrin Mani**

*Dr. Nasrin Mani is the founder of the La Jolla Cosmetic Laser Clinic, a Board Certified Ophthalmologist and eye surgeon. The precision skills developed in delicate eye surgery – and the gratifying results – led her to establish a state-of-the-art cosmetic laser clinic. Dr. Mani was named San Diego Top Doctor for the fifth time in 2016.*

*She graduated from the Vanderbilt University Ophthalmology Program in 1986 and completed her Vitreo-Retinal Surgical Fellowship at Doheny Eye Institute and University of Southern California. She is a member of the American Society of Laser, Medicine and Surgery (ASLMS), the California Academy of Cosmetic Surgery, and many other professional organizations.*



**“Because of using QX MAX and SP Dynamis I can sleep better at night”**

In comparison to the other systems, the safety and predictability of Fotona lasers is unmatched.

**How many years have you worked with lasers?**

I have been working with lasers since 1983. The precision skills developed in delicate eye surgery and the gratifying results were my inspiration to establish a state-of-the-art cosmetic laser clinic in 2005. Currently I have over 20 lasers and energy-based devices in my office.

**What do you like about Fotona lasers, and how they compare with the many others lasers in your clinic?**

I am passionate about all of the lasers and light based systems in my aesthetic practice. However, I use my Fotona lasers more than any of the other systems. In comparison to the other systems, the safety and predictability of Fotona lasers is unmatched.

I find that the QX MAX and the SP Dynamis deliver predictable outcomes. I can sleep better at night after treating my patients with skin of color. I can use the QX MAX on patients who normally would be at high risk for complications with other lasers or light-based devices such as IPL (Intense Pulsed Light). Both lasers deliver safe and effective results to patients on a consistent basis.

**Which procedures do you perform with your Fotona lasers?**

Resurfacing in conjunction with acne subcision is one of the most dramatic procedures that I do in my practice. With the SP Dynamis, I am able to offer significant improvement to patients with severe acne scarring, who in the past would not have had viable options for treatment.

The QX MAX has multiple applications. We use it in our office to treat tattoos of all colors, acne, brown spots, melasma, and a variety of other conditions. I have seen beautiful results with our acne patients. I have many different lasers and light based systems to choose from, but the QX MAX is always my first choice when it comes to treating acne on my patients who are skin type 4 and beyond.

**What trends in laser treatments do you foresee in upcoming years?**

In the years to come, I hope to see further integration of lasers and stem cell therapy. I feel that the possibilities are endless for the treatment of aging, wound healing, and the management of scars.

With the SP Dynamis, I am able to offer significant improvement to patients with severe acne scarring, who in the past would not have had viable options for treatment.

By Romana Pahor **An interview with Pham Huu Nghi, M.D., Ph.D, Associat Prof., the head of Department of Medical laser research at the 108 Military Central Hospital in Vietnam**

**About Pham Huu Nghi**

Dr. Nghi graduated in 1981 from the Military Medical University in Vietnam and accomplished his specializations in General Surgery, Plastic Surgery and Microsurgery at the 108 Military Central Hospital in 1988 and at the Hanoi Medical University in 2005. In 2002, he received his Ph.D degree from the Vietnamese Military Medical Academy. Currently, he holds the position of Associate Professor on Laser application in medicine and surgery at the 108 Institute of Clinical Medical-Pharmaceutical Sciences, and is the head of Department of Medical laser research at the 108 Military Central Hospital, Vietnam. He is a member of the Executive Committee of the Association of plastic surgery and aesthetics in Hanoi. His research areas are mainly in medical laser applications (laser therapy and aesthetic laser). He is also currently a medical consultant for the Venus Medi Aesthetic Clinic.



**“Investing in one multifunctional piece of equipment saves many costs”**

As an experienced doctor who has used many different types of lasers for a long time, I am truly satisfied with my Fotona laser and its technology.

**How long have you been using a Fotona laser, and are you satisfied with the results?**

After only a short period of time (we acquired our Fotona laser in June, 2015), I can say that the system offers a high and consistent level of quality, high clinical effectiveness, and can be widely applied. Nevertheless, to obtain such desirable results, doctors as well as medical practitioners must have a deep knowledge about lasers in general and about their Fotona laser in particular, since it is a very professional and modern system.

**Which treatments do you particularly like to perform with your Fotona laser?**

With our Fotona SP Dynamis laser, I am able to conduct many techniques such as 3D & 4D facial rejuvenation, vaginal rejuvenation, abdominal wrinkle reduction, eye bag reduction, hair removal, snoring treatment, telangiectasia, keloids, hypertrophic scars and hemangioma

Fotona’s Smooth Eye treatment does not require surgery, it causes no pain and leaves no risk of surgical complications.

treatments. Among these techniques, I am extremely impressed with 4D facial rejuvenation, telangiectasia treatment and eye bag reduction. 4D rejuvenation is a highly effective technique that only Fotona has. Previously, I used to apply Thermage in my treatment, however, it caused pain for the patient. The consumable supplies cost was high, yet the clinical efficiency was only moderate. Ever since I started using Fotona 4D rejuvenation to replace Thermage, the above issues were solved. It brought remarkably effective results and satisfaction for my customers. Fotona 4D rejuvenation resolves the sagging cheeks problem and the nasolabial fold very well. Moreover, it enhances sunken cheeks and helps prevent Bichat’s fat pad (with step 1: Intraoral tightening). It also contributes to the cheek slimming pad nasolabial fold reduction. Furthermore, to increase the efficiency of 4D rejuvenation, in the case of sagging and aging problems (i.e. senior customers), I often combine this technique with

HIFU, or thread lift for facial rejuvenation, and the end result often delivers satisfaction to even the most difficult customers.

**What do you see are the advantages of a laser-based approach?**

Besides the benefits of rejuvenation (skin, vagina), the Fotona laser with its dedicated tools can help solve many different types of diseases. Investing in just one multifunctional piece of equipment that delivers high clinical efficiency and effectiveness, has saved us costs for not consuming material supplies. This is one of the best advantages of our Fotona laser. In addition, the techniques and technologies of Fotona offer such in-depth features and convenience, it makes the system highly effective without being too complex for treatments. As an experienced doctor who has used many different types of lasers for a long time, I am truly happy and satisfied with my Fotona laser and its

technology.

**What are the benefits of the Fotona Smooth Eye treatment?**

Fotona’s Smooth Eye treatment is a non-invasive eye bag reduction technique. Its advantage is that it does not require surgery, it causes no pain and leaves no risk of surgical complications. According to my observations, the effectiveness of the Fotona Smooth Eye treatment is often higher among younger customers whose eye bags are not too vivid. With senior customers, whose eye bags are already big and whose skin appears saggy, the result is usually not as high. The limitation of the Fotona Smooth Eye Treatment is that customers will have to do the treatments repeatedly, as the eye bags do not permanently disappear. If Fotona had a method to directly make an impact on the fat mass effectively, it would be even better.

A close-up photograph of a person's face, focusing on the right eye. The eye is light-colored, possibly green or hazel, and is looking directly at the camera. The skin is fair and has a soft texture. The word "DEPTHE" is overlaid on the image in large, white, sans-serif capital letters. The letters are semi-transparent, allowing the underlying image to be seen through them. The 'D' is on the left, followed by 'E', 'P', 'T', 'H', and 'E' on the right. The background is a soft, out-of-focus light color.

DEPTHE

By Leonardo Marini **Efficient and complication-free tattoo removal strategies are highly requested by patients due to the large number of tattoo procedures performed worldwide. Virgin multicolored and previously treated “resistant” tattoos can be quite challenging to “clear” using conventional laser approaches. Recently, sequential multilayer laser techniques and picoseconds lasers have been proposed to “revitalize” tattoo removal procedures.**

## Sequential Multilayer Tattoo Removal with FracTAT

Patient satisfaction levels were extremely high due to the significant pigment reduction observed after the first laser treatment.

Q-Switched laser systems, working within a timeframe of 4-10 ns, have been considered the gold standard option to remove tattoos since the 1980s, and their technology has progressively improved. Tattoo removal adopting a single-pass Q-Switched laser approach requires high numbers of sessions and a long therapy, since a minimum of a 2-3 month interval is needed between treatments. Pushing laser energy and pulse stacking to the limit has proven to be less than ideal, generating complications and side effects without improving tattoo ink removal.

In an attempt to optimize tattoo removal procedures, new innovative laser strategies have recently been proposed, with variable degrees of clinical success. Ablative fractional lasers (2940 nm Er:YAG and 10600 nm CO<sub>2</sub>) have been used to destroy exogenous dermal pigments independently from their color, proving particularly useful in allergic reactions to tattoo chemical components. We like the ability they provide to perform multiple laser passes – up to three – following a sequential energy layering protocol, but without waiting the 20 minutes required for the QS-related sub-epidermal gas bubbles to be spontaneously absorbed. The tattoos are primed with a single 2940 nm Er:YAG pass in order to obtain two results: to color-blindly destroy a fraction of the dermal pigment and “drill” 250-micrometer channels for the QS-induced gas bubbles to escape through. This preliminary fractional priming did not visually interfere with the visual perception of the tattoo design, allowing operators to precisely follow the tattoo color tracks with the full-beam QS laser. Two or three full-beam QS laser passes were subsequently layered at 5-minute intervals. Clinical results were extremely favorable, leading to 60-to-80% tattoo clearing after a single session.



**Fig 1:** (A) Heavily pigmented black tattoo on right forearm (volar aspect). Clinical comparison between the pre-ablative fractional 2940 nm laser primed area (B-left) and intact skin (B-right) immediately after full-beam Q-switched laser (single 1064 nm Nd:YAG laser pass). Note cavitation bubbles trapped under intact epidermis and gas escape through AFR pre-treated skin. (C) Better pigment clearance (80–90%) was observed with the combined AFR plus full-beam QS site 3 months after a single treatment.

Another new approach using ablative fractional Q-switched laser technology has been recently introduced, paving the way for virtually thermal-free photo-acoustic tissue ablation and remodeling. The idea of combining a photo-acoustic ablative fractional 1064-nm Q-switched laser technology with a sequence of 2-3 full beam Q-switched laser passes has proven effective in reducing multilayer laser session time as well as the number of sessions required to clear tattoo pigments both in ‘virgin’ and resistant tattoos. Skin textural changes related to tattoo procedures and previously performed tattoo removal procedures can be improved by photo-acoustic ablative fractional Q-switched laser-tissue remodeling.

With the advent of fractional QS “FracTAT” technology, we performed a study to compare it with 2940 nm Er:YAG laser fractional priming, and the clinical results were similar.

### 30 tattooed people underwent one full multilayer QS laser treatment

Study: 30 subjects, 19-42 years of age, Fitzpatrick phototype II-III, with monochromatic and polychromatic previously untreated professional tattoos underwent one full multilayer QS laser treatment. Treatments were performed with a QS laser platform (QX MAX - Fotona, Slovenia) at 1064 nm Nd:YAG (with a 5 mm x 5 mm fractional handpiece able to produce a perfect array of 25 MAZ (Micro Acoustic Zones), 4 mm spot, 12.7 J / cm<sup>2</sup>, 5 Hz, stack 5 setting - followed by two 1064 nm (3-5 mm spot, 6-6.8 J/cm<sup>2</sup>, 4-5 Hz) / 532 nm (3 mm spot 3 J /cm<sup>2</sup>, 4-5 Hz) full-beam QS laser passes (QX MAX - Fotona, Slovenia). Capillary bleeding was observed from each photo-acoustic micro-ablative spot, confirming the author was able to reach the papillary and upper reticular dermis. Five-minute intervals

were sufficient to stop capillary bleeding, allowing the following full-beam laser passes to be safely and efficiently performed.

Post-operative primary dressing was performed with Flaminal sterile alginate gel (Flen Pharma, Belgium). Standardized digital photographs were taken at baseline, 1 month and 3 months. Subjects were evaluated for tattoo clearing and texture improvement (rating scale 1-5, 1=no effect, 5=excellent 100% clearing).

### Results: up to 80% clearing after just one session

Highly significant improvements were observed regarding pigment clearing and skin texture in all treated subjects. Mean post-op recovery time was 7-10 days. No scarring and/or infections were observed. The same successful clearing rate was observed after the first laser session in the majority of tattoos (up to 80%). Up to 90% of treated tattoos (20 cases) showed an almost complete pigment clearing after 4 sessions (Figures 2, 3, 4). Interestingly, we were able to improve both skin color and textural irregularities with difficult-to-treat resistant tattoos – after up to 16 previously performed laser treatments. Patient compliance and satisfaction levels were extremely high due to the significant pigment reduction observed after the first laser treatment, a painless procedure and the standardized dressing sequence.

A multilayer sequential combination of fractional and full-beam QS laser can safely and effectively reduce intradermal tattoo pigment, improving skin texture as well.



**Fig 2:** (A) Monochromatic tattoo (upper arm). (B) Image taken immediately after fractional priming. (C) Image taken immediately after full-beam Q-switched laser treatment. (D) Clinical result show almost 100% pigment clearing after four multilayer fractional (one 1064-nm laser 'priming' pass) and full beam Q-switched (two 1064 nm laser passes).



**Fig 3:** (A) Monochromatic tattoo (lower arm). (B) Image taken immediately after fractional priming. (C) Clinical result (almost 70% pigment clearing) after three multilayer fractional (one 1064-nm laser 'priming' pass) and full beam Q-switched (two 1064 nm laser passes).



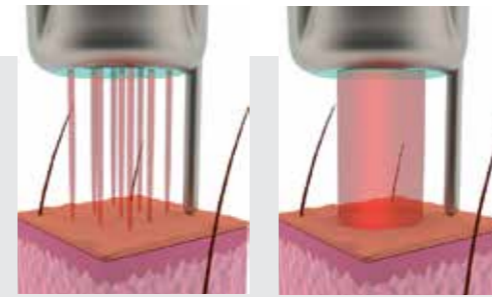
**Fig 4:** (A) Color tattoo (back). (B) Clinical result (almost 90% pigment clearing) after two multilayer fractional (one 1064-nm laser 'priming' pass) and full beam Q-switched (two 1064 nm laser passes).

**A winning combination: treatments with Q-switched fractional laser and short full-beam Q-switched laser**

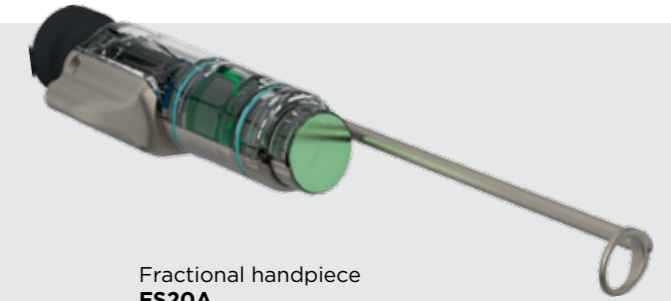
Recently introduced combination treatment with the Q-switched fractional beam ("FracTAT") followed by the full-beam Q-switched laser, both enabled by the StarWalker's high energy MaQX mode, seem to be a winning combination to rapidly and effectively clear intra-dermal tattoo pigments. The combined FracTAT treatment improves the external elimination of pigments, and as well their internal distribution within the lymphatic system. Pre-treatment with fractional Q-switched

laser reduces the inter-pass waiting time when performing a multi-QS full-beam laser pass technique, helps to improve post-laser skin textural changes in resistant tattoos, and reduces the number of laser sessions necessary to obtain a good tattoo "clearing".

In conclusion our research shows that a multilayer sequential combination of fractional and full-beam QS laser can safely and effectively reduce intradermal tattoo pigment, improving skin texture as well.



Fractional beam Full-beam



Fractional handpiece FS20A

**Full-beam and fractional handpieces**

The StarWalker's full beam and fractional handpiece technology enables physicians to provide advanced solutions for a broad range of treatments. Fractional handpieces harness the powerful photomechanical effect of the StarWalker into tightly focused arrays. These arrays contain concentrations of energy while the surrounding area remains unaffected by the laser light.

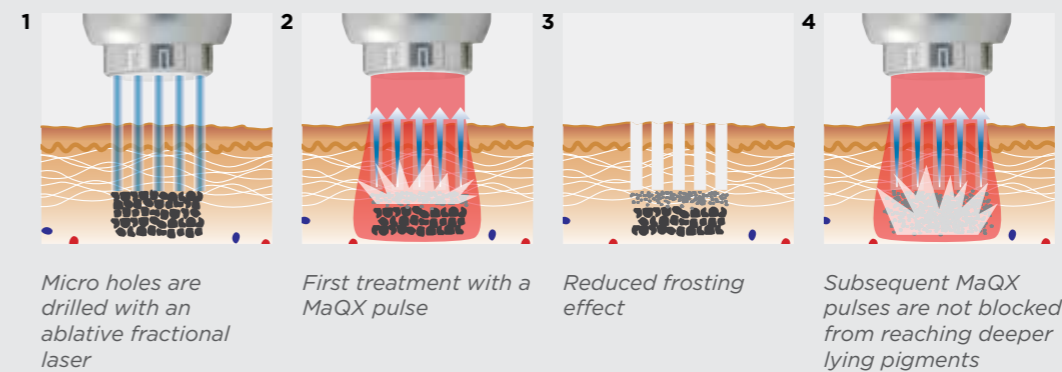
When a Q-switched laser pulse strikes the tattoo pigment it generates gas and steam within the skin. This causes an optical shielding or "frosting" effect that prevents any subsequent laser pulse from effectively reaching the deeper-lying pigments. Furthermore, gas bubbles which are formed around the pigment particles can damage the surrounding tissue.

When the Fotona patented FracTAT™ procedure is performed, micro holes are first drilled into the skin using a fractional ablative laser handpiece. The fractional micro holes act as pressure relief ducts through which the gasses can escape without building up excessive pressure.

**Advantages of FracTAT:**

- Enhanced generation of photoacoustic shockwaves
- Reduced frosting and pressure on surrounding tissue
- Multiple MaQX irradiations can be made during a single session
- Direct pigment removal via ablation and healing of fractionated skin
- Enhanced generation of photoacoustic shockwaves

**FracTAT™ treatment**



By Adrian Gaspar **Non-invasive body sculpting is one of the fastest growing market segments in aesthetic medicine. Laser-assisted lipolysis is a popular, minimally invasive surgical procedure that is considered safer and results in shorter downtime compared to traditional liposuction. Despite these benefits, it is still considered a surgical procedure as it is associated with surgical incisions and the use of anesthetics, and adverse effects are still possible. Furthermore, many patients are not ready for and will never consider any surgical procedure, no matter how “minimally invasive” it is.**

## Combined Laser Treatment for Non-invasive Body Sculpting

This minimally traumatic technique offers significant advantages: minimal postoperative pain, swelling, and lack of local infections, necrosis or unacceptable scarring.

Non-invasive “cellulite treatment” procedures and devices have been used for many years, from topical agents, oral, massage, carbon dioxide, compressive and shock-wave therapy to energy devices which involve ultrasound (US), cryolipolysis, radio frequency (RF), infrared (IR) radiation, diode and laser therapy, with significant heterogeneity in effect between different

treatments. Non-invasive thermolipolysis is one of the procedures that induce either adipocyte necrosis or apoptosis or stimulate normal lipolysis metabolism with the breakdown of triglycerides to glycerol and free fatty acids, which are metabolized through normal hepatic pathways.

It has been previously demonstrated that damage to adipocytes during exposure to heat, such as from a laser, is exponential and dependent on the temperature and length of exposure. Heat can induce delayed vascular alterations and reduce adipocyte viability to 40% with 3 minutes of cellular exposure to 45°C.

### Combining Er:YAG and Nd:YAG: superficial tightening with deep skin heating

Er:YAG and Nd:YAG lasers have been used successfully for mucosa tissue and skin tightening. During a combined Er:YAG and Nd:YAG laser treatment using thermal pulses, superficial tightening is combined with deep heating of the skin. The 2940 nm Er:YAG laser in the non-ablative regime acts to deliver energy onto the skin to produce controlled surface-tissue heating without ablation, as well as subsequent collagen remodeling, with the purpose of improving skin or mucosa thickness, elasticity and firmness. Superficial tightening using thermal Er:YAG pulses works to improve flaccidity and the surface appearance of the area.

For the purpose of deep bulk heating of the skin, 1064 nm Nd:YAG can be used in a super-long PIANO® pulse modality. This seconds-long pulse regime enables

sufficient time for the epidermis to share the absorbed heat with the dermis through heat diffusion, thus sparing the epidermis from potential injury. During the treatment, the generated heat is transmitted through the skin, increasing local vascularization and accelerating organic chemical reactions, including fat metabolism, as well as causing the tightening of deep connective structures (reticular dermis, retinaculum cutis, fasciae).

### TightSculpting™ is the new promising non-invasive alternative

A number of patients have come to our clinic for the purpose of skin tightening and fat reduction on smaller areas of the body, such as the abdomen, back, thighs, arms and chin. We aimed to test a new laser treatment method for non-invasive body sculpting known as TightSculpting™, which involves superficial tightening of the skin using a 2940 nm Er:YAG SMOOTH thermal pulse, combined with deep bulk heating of the skin to temperatures above 40 °C using a seconds-long 1064 nm Nd:YAG PIANO® pulse. The idea is to simulate the same effects achieved during laser lipolysis and generate an increase in tissue temperature to above 40 °C. Local anesthetic cream was applied to the treatment areas for 30 min and removed before the treatment. Areas for the treatment were clearly marked and divided into smaller areas if needed. Laser application lasted about 15-30 min per each body area and consisted of 2 consecutive steps, performed on each of the pre-marked smaller areas in the following sequence:



#### a) Superficial skin tightening with thermal Er:YAG pulses

A 2940 nm Er:YAG laser (SP Dynamis, Fotona) was used in LP/VLP/XLP regime (pulse duration) in a non-ablative manner, using an R04 handpiece (12 mm spot size), fluence of 1.1-1.3 J/cm<sup>2</sup> and frequency of 10 Hz. Our technique involved using both hands: the guiding hand to stabilize the skin to ensure we reach all the structures and the working hand to deliver the laser treatment. Due to irregular heat penetration, multiple passes should be performed across each of the pre-marked smaller areas, simulating a continuous brushing movement, much like with a laser lipolysis cannula.

#### b) Deep skin tightening and reduction of adipose tissue with super-long-pulse Nd:YAG

A 1064 nm Nd:YAG laser was used (SP Dynamis, Fotona) in a super-long-pulse regime of 18 - 21 sec (PIANO® pulse) with an R34 handpiece (20 mm spot size) and fluence of 400 J/cm<sup>2</sup>. The same technique was used as in the above-described step, performing multiple passes across the same area in a continuous motion (Figure 1).

The treatment is comfortable and needs no special after care. The patient can return to daily activities immediately afterward.

*Tightening of deep skin structures with super-long Nd:YAG PIANO® pulse. Multiple passes across the same area are performed in a continuous motion.*



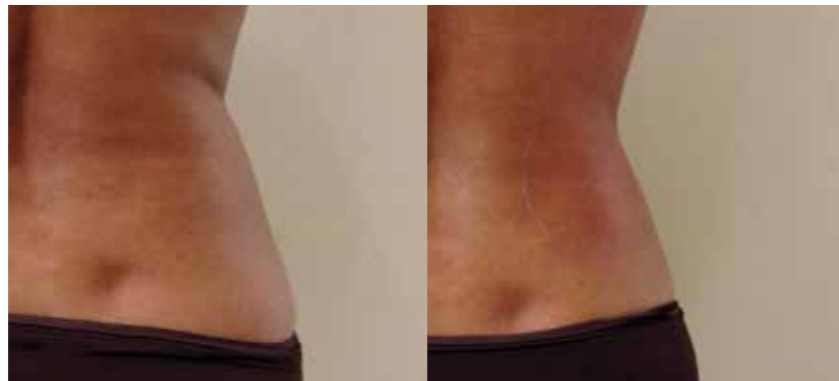
An average of 7-8 cm in waist circumference reduction can be achieved.

The whole procedure was performed on each of the separate body units (abdomen, waist, etc.) before moving to the next. Up to as many as 8 sessions can be performed, with a minimum of a 10-day interval.

**Significant reduction after just 1 session**

With this combined procedure, we were able to achieve immediate and lasting effects (Fig. 2-5). From our experience, an average of 7-8 cm in waist circumference reduction can be achieved. Moreover, ultrasound evaluation showed significant reduction after just 1 session (Fig. 6). However, results varied between patients, with more effects in some and less in others.

**Fig. 1:** TightSculpting™ laser treatment of the waist region. Before (left) and immediately after 1 session (right).



**Fig. 2:** TightSculpting™ laser treatment of the waist region. Before (left) and 3 months after 2 sessions (right).



**Fig. 3:** TightSculpting™ laser treatment of the abdominal region on a patient with a history of laser lipolysis. A successful destruction of fibrotic tissue areas as well as improved skin flaccidity are seen immediately after 1 session (right).



**Fig. 4:** TightSculpting™ laser treatment of the thigh area. Before (left) and after 8 sessions (right).

Transient erythema was observed immediately after the treatment in all cases, but was resolved within a few hours to a few days. The treatment is comfortable and needs no special after care, and the patient can return to daily activities immediately afterward.

The effects may be further improved with a 20 minute light cardio workout (on a stationary bicycle or treadmill) immediately after each session, followed by lymphatic drainage, which may help to immediately metabolize the fatty acids released as an energy source during the laser treatment. If possible, a compression garment is recommended to be used 12 h per day for the first month after the treatment and 6 h per day for the following month. In our case, the ideal patient for the treatment had a BMI between 25 and 30. Routine or effective diet and physical exercise may help to maintain the effect of the treatment, but for areas of lipodystrophy with poor vascularization of the adipose areas, this method represents a safe and effective alternative to laser lipolysis.

**A combination of comfort, safety and efficiency**

The combined Er:YAG and Nd:YAG laser treatment for body contouring known as TightSculpting™ has proven to be a comfortable, safe and effective treatment for transdermal skin tightening and reduction of adipose tissue. In combination with a healthy lifestyle, this method represents a very promising non-invasive alternative to laser lipolysis.

In combination with a healthy lifestyle, TightSculpting™ represents a very promising non-invasive alternative to laser lipolysis.

By Ana Maletic

Ines Maletic, Dusko Maletic

**Cutaneous warts represent an unsightly and sometimes painful disturbance. Fortunately, laser treatment is a relatively efficient and patient-comfortable approach. A new dual-wavelength method combining both Er:YAG and Nd:YAG lasers offers a highly efficient treatment of warts without damaging the surrounding tissue, allowing for faster recovery.**

## Dual-wavelength for highly efficient treatment of warts

This is the first report on the combination of Er:YAG and Nd:YAG for the treatments of cutaneous warts.

Cutaneous warts are benign skin proliferations caused by human papillomavirus (HPV) infection, with prevalence varying between 3% and 24%, depending on the age and population studied. Generally, cutaneous warts can last for a few months to a couple of years and usually resolve spontaneously in healthy

people. However, some may persist for many years and represent an unsightly (face) or painful (feet) disturbance.

The clinical appearance depends to some extent on the type of HPV and the anatomical site affected. The most common type of warts are common warts (*verruca vulgaris*), which most frequently affect the hands and feet, and when found around the nail plate these are called periungual warts; filiform or digitate warts are mainly observed on the scalp or the beard area; plane or flat warts (*verruca plana*) are most commonly found on the distal limbs and face; single or mosaic plantar warts (*verruca plantaris*) are most commonly found on the feet.

There is no single treatment that results in clearance of the different types of cutaneous warts. In healthy people, especially young people, warts usually resolve spontaneously. However, warts in patients with a long-lasting infection or immunosuppressed patients may be more resistant to treatment and usually do not resolve spontaneously. Treatment may also be recommended because of pain or due to aesthetic reasons.

### Traditional VS Laser Therapy

Traditional therapy consists of topical agents containing salicylic and/or lactic acid, cryosurgery, electrocautery or more aggressive methods, e.g. surgical excision or immunotherapy, for the most resistant warts. However, problems that limit the usability of traditional therapies include: modest efficacy when compared to no treatment, relatively high recurrence rates, an absence of response in some cases and skin discoloration at the site of application.

The use of lasers in wart treatment is not new. 585 nm pulsed dye lasers have been used for treating recalcitrant warts, but up to 5 sessions may be needed to achieve resolution. Long-pulsed Nd:YAG lasers have also been used for the treatment of recalcitrant or untreated warts; common warts responded well, but deep palmoplantar warts required up to 4 laser sessions. Laser pulses from these laser wavelengths are absorbed by hemoglobin and therefore target the blood vessels and indirectly affect the wart through thermal damage of blood vessels. Ablative CO<sub>2</sub> or Er:YAG lasers, on the other hand, completely remove the wart tissue by ablation, providing a valid alternative to conventional treatments especially in cases of more resistant warts, e.g. periungual or mosaic plantar warts. CO<sub>2</sub> laser treatment resulted in clearances of 64% to 100%, but scarring and post-operative pain were associated with the treatment. The tissue interaction of the CO<sub>2</sub> laser beam provides some degree of coagulation of the surrounding tissue, known as residual thermal damage. This effect, on the other hand, compromises wound healing, leading to extended healing times and an increased risk of side effects.

The Er:YAG laser, with its 2940 nm emission, has a 10x greater absorption in water compared to the CO<sub>2</sub> laser, which results in enhanced tissue vaporization and reduced thermal damage, reducing the risk of side effects, e.g. scarring or hypopigmentation. Therefore, the use of Er:YAG lasers seems a rational alternative. Reported rates of recurrence after Er:YAG wart removal are from 6% to 24%.

Since both Er:YAG and Nd:YAG lasers have proven effective in wart treatment, though with some limitations, we decided to evaluate a combination therapy considering the diverse mechanism of action of each laser wavelength. Nd:YAG laser treatment is believed to effectively complement ablative laser treatment by targeting the underlying vasculature supplying the wart and thus the blood supply to the residual wart tissue.

To the best of our knowledge this is the first report on the combination of Er:YAG and Nd:YAG for the treatments of cutaneous warts.

### Combined Er:YAG and Nd:YAG Procedure: the Evaluation

A clinical study designed to evaluate the effectiveness of the dual-wavelength wart treatment was performed using a 2-step procedure. 13 patients (6 males and 7 females), mean age 26.6 (range 5 - 57), were included in the analysis. In total, 17 warts, of which 9 plantar (including 2 large mosaic warts), 5 common and 3 periungual, were treated with an Er:YAG/Nd:YAG laser (SP Dynamis, Fotona, Slovenia). With respect to body location, 8 warts were found on the sole, 3 on the toe, 2 on the arm, 3 on the finger and 1 on the face.

The 1st step consisted of ablation of the warts with Er:YAG laser, while the 2nd step consisted of coagulation with the Nd:YAG laser. During treatment the skin was cooled with a Zimmer cooler. 3 patients also received local anesthesia with 2% lidocaine. The patients returned for follow-up at two years post treatment.

Of the 13 patients with a total of 17 warts treated with new approach, 100% clearance was achieved with an average of 1.3 treatment sessions.

The method proved to be safe and comfortable for the patients: Nd:YAG coagulation after ablation resulted in no post-treatment bleeding, no infection or scar formation.

71% of the warts were cleared after a single laser session and 29% were cleared after two laser sessions. In the latter case, the 2nd session was performed at least 1 month after the first session. Plantar mosaic and periungual warts proved to be more resistant to laser treatment; 2 sessions were needed to clear these types of warts, whereas a single session was necessary for common and simple plantar warts. All patients came regularly to follow-up visits, ending up with a follow-up of 2 years, and no recurrences were observed. On average, 1.3 sessions were needed, considering the number of warts per type distribution (Figure 1), to achieve a 100% clearance rate.

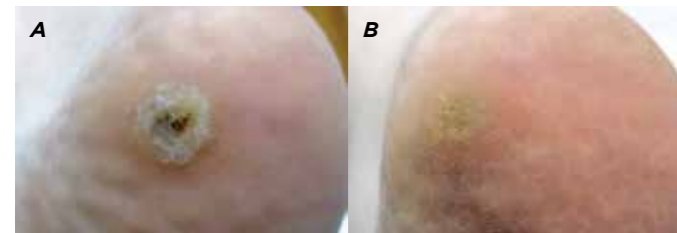
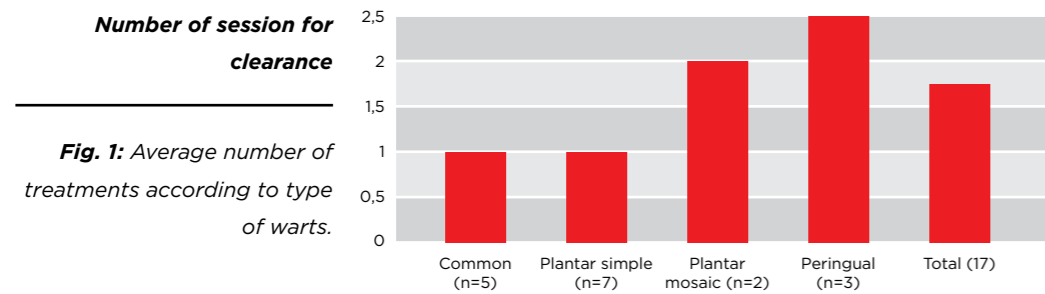


Fig. 2: Plantar wart (A) before and (B) 2 months after a single session of laser treatment.

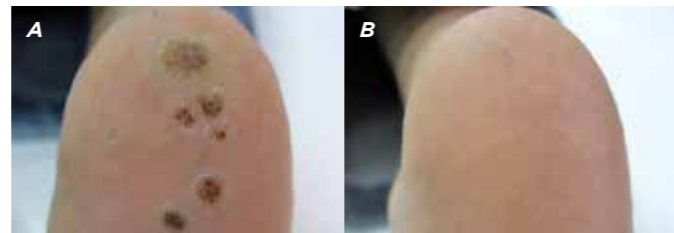


Fig. 3: Multiple plantar warts (A) before and (B) 2 years after a single session of laser treatment.

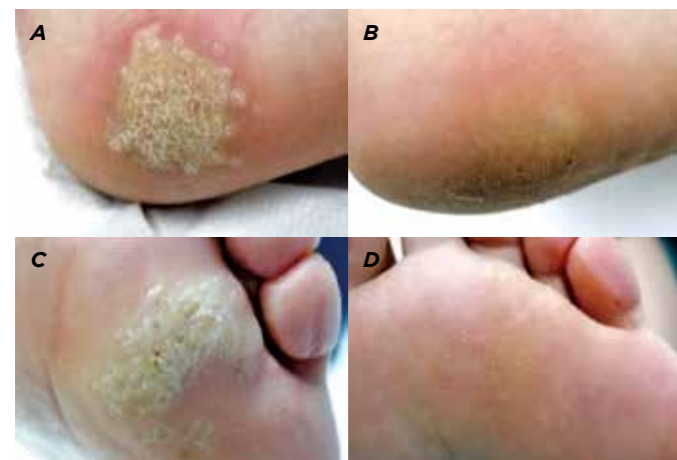


Fig. 4: Two cases of plantar mosaic warts (A, C) before and (B, D) 2 years after two sessions of laser treatment.



Fig. 5: Two cases of common warts (A, C) before and (B, D) immediately after laser treatment.



Fig. 6: Periungual warts (A) before and (B) 2 months after two sessions of laser treatment.

**Two-step Therapy in practice: 100% clearance with an average of 1.3 treatment sessions**

The method proved to be safe and comfortable for the patients: Nd:YAG coagulation after ablation resulted in no post-treatment bleeding (Figure 6), and no infection or scar formation on the treatment site were recorded at follow-up visits. Only 1 patient developed post-inflammatory hyperpigmentation on the treated site, which is a rare but known possible side effect of laser treatment, and 1 patient developed a de-novo filiform wart at an adjacent location.

Of the 13 patients with a total of 17 warts treated with this new approach, 100% clearance was achieved with an average of 1.3 treatment sessions, including also more resistant mosaic plantar and periungual warts. Plantar warts, especially those found on the feet, usually cover much deeper skin layers. The Er:YAG laser enables a layer-by-layer precise ablation of the tissue to remove the wart in its entirety without considerable damage to the adjacent tissue, thus reducing the risk of recurrence. In fact, none of the patients developed a recurrence in 2 years. Only 1 patient developed a wart on a location adjacent to the treatment area.

The low recurrence rate may also be explained by a synergistic effect of Nd:YAG on the wart. Nd:YAG laser alone has been used for wart treatment using similar parameters as those used in our study. Han et al. reported clearance rates of 96%, however, up to four treatment sessions were required. Semprimoznik et al. reported on a case of mosaic plantar warts being effectively cleared after a single session of Nd:YAG using the same parameters as in our study. Although the mechanism of Nd:YAG action on warts is not yet proven, the most probable Nd:YAG targets are the dilated vessels in the papillary dermis, which are a characteristic feature of warts. Light microscopic evaluation of Nd:YAG treated warts have shown epidermal necrosis and destroyed blood vessels in the dermis surrounded by a dense inflammatory infiltrate. In our study, targeting the vessels that supply nutrients and oxygen to the virally infected tissue may have additionally aided in eliminating the wart, even in cases where ablation did not remove the wart tissue completely and recurrence would have occurred otherwise.

In addition to achieving clearances of 100% without recurrence in two years, the procedure is convenient for the patient since a maximum of two sessions is needed.

**A promising and efficient method of wart elimination**

We suggest that Er:YAG ablation of warts combined with Nd:YAG coagulation of the dilated wart vessels is a promising and efficient method of wart elimination. In addition to achieving clearances of 100% without recurrence in two years, the procedure is convenient for the patient since a maximum of two sessions is needed.

By *Jasmina Kozarev* **Er:YAG laser ablation offers a highly precise, simple, and effective method for treating linear verrucous epidermal nevi. Verrucous epidermal nevi are cutaneous hamartomas consisting mainly of keratinocytes, characterized by papulokeratotic and verrucous papules and plaques covering large areas of the skin in a linear pattern. Epidermal nevi usually arise on the torso and extremities, and are often present at birth as flat tan or brown marks, but become more apparent in adulthood as they become thickened and often warty.**

## Complete removal of verrucous epidermal nevi in two treatments

This minimally traumatic technique offers significant advantages: minimal postoperative pain, swelling, and lack of local infections, necrosis or unacceptable scarring.

### Resurfacing with a 2940 nm Er:YAG laser

Er:YAG laser, with its ideal wavelength of 2940 nm, allows for more gentle and precise skin ablation. The energy is very efficiently absorbed by water, and can be used to produce a minimal thermal injury to approximately 5 to 10 micrometers.

When lasing with Er:YAG in the cold ablation regime, the vaporized, atypical, disorganized epidermal cells are replaced with normal, well-organized keratinocytes from the follicular adnexa.

This minimally traumatic technique offers significant advantages in relation to the other comparable techniques (electrocautery, fulguration, CO<sub>2</sub> laser, etc.). Due to the low level of tissue destruction and minimally traumatic procedure, the key benefits of using Er:YAG laser resurfacing in the treatment superficial skin lesions include: minimal postoperative pain, swelling, and lack of local infections, necrosis or unacceptable scarring. Er:YAG resurfacing can provide complete removal of verrucous epidermal nevi in two treatments, which is very important when considering a large surface treatment area.

### Two treatments for complete removal

The following case involves a 22-year-old female patient with linear epidermal nevus. The lesion unilaterally affected the external side of the upper left arm from the cubital space to the shoulder, the left mammary region, the left neck region, and the left part of the back from the shoulder to the gluteal region (Fig. 1). Several dermatological treatments, i.e. topical corticoids and keratolytics, calcipotriol, cryotherapy, and radio wave surgery were previously performed without significant results.

Prior to laser treatment, skin biopsies were taken and histopathology examinations showed hyperkeratosis, papillomatosis and acanthosis with elongation of the rete ridges, with no pigmentary incontinence or dermal abnormalities. In consideration of this, we performed resurfacing with a 2940 nm Er:YAG laser (Dualis SP II, Fotona, Slovenia) with percutaneous EMLA local anesthesia.



**Fig. 1:** 22-year-old patient with verrucous linear epidermal nevus.

### Up to five passes for each affected region

The area to be treated was first cleaned with an antiseptic solution. Then the lesion was anesthetized with EMLA and the 2940 nm Er:YAG laser was used in the cold ablation regime. We used a 3 mm spot size, pulse energy of 300-1000 mJ, fluence 5-14 J/cm<sup>2</sup>, and a pulse repetition rate of 8 Hz.

A lower fluence of 5 J/cm<sup>2</sup> was used in the delicate neck area or for superficial lesions. Higher energy densities of 14 J/cm<sup>2</sup> were used in thicker areas such as the lower back and shoulder.

For each region of the nevi, two to five passes were carried out during the same session. Between the two passes, the resulting desiccated tissue debris was wiped away with saline soaked dry gauze. Additional passes were carried out over the remaining lesions to smoothen them, but with increasing risk of complications.

The postoperative site was cleaned with no necrotic tissue remaining. Postoperatively, a sterile OpSite dressing was applied. On the second day, redressing was performed. A topical antibiotic ointment was applied twice a day during the ensuing 2 weeks when the healing process was completed. On the second day, and in weeks 1, 4, 8, 12, 24, and 48, evaluation of the healing process was performed by means of clinical exams as well as photography.

A year after the first treatment, the procedure was repeated to remove the remaining epidermal nevi.

The entire nevus was removed after two sessions, using up to five passes across the whole area.



**Fig. 2:** Appearance before (upper pictures) and 10 months after the first treatment.



**Fig. 3:** Appearance 2 weeks after Er:YAG laser resurfacing.

**Fig. 4:** Appearance 6 months after second Er:YAG laser treatment.

### Leaving no scars and atrophies

The entire nevus was removed after two sessions, using up to five passes across the whole area (Figs. 2 - 4). Healing was achieved with a satisfactory cosmetic result (Fig. 2). The treated areas re-epithelialized within 2 weeks, leaving small erythematous patches. Three months after treatment, no recurrence was seen with any pigmentary changes. Consequently, there was no scarring. Only minor erythematous papules were visible after the first treatment (Fig. 3, after) and were successfully removed with an additional session performed 1 year after the first treatment (Fig. 4).

The patient's discomfort was minimal and her satisfaction with this method of treatment was high.

More pronounced dermal inflammatory lesions of Verrucous Linear Epidermal Nevus (IVLEN) require more laser passes and a more aggressive treatment. The underlying dermis must be removed or destroyed, thus increasing the risk of unwanted scarring.

To avoid scars we preferred to perform one to five passes at lower energy, since we hypothesized that the relative decrease in adnexal structures on the neck along with a relatively thinner epidermis such as in mammary region and a decrease in vascularity in the neck region is responsible for increased side effects. Our young female patient with verrucous epidermal nevi had a good recovery without relapse. The resulting wounds healed without complication. Superficial lesions responded optimally with complete regression, leaving hyperpigmented patches in some area and no scars or atrophy. The Er:YAG resurfacing technique provided complete removal of the lesion in only two treatments, which was very important considering the large surface treated. The patient's discomfort was minimal and her satisfaction with this method of treatment was high.

### Swift recovery of the wound

Er:YAG resurfacing is a highly precise, simple, and effective method of treating linear epidermal nevus, which can be repeated if lesions should reoccur. Appropriate laser power allowing sufficient ablation, while avoiding deep dermal changes, are needed for successful treatment. Suboptimal procedures lead to recurrences. The healing of the wound after removing the linear epidermal nevus was astoundingly swift. In comparison with other ablative laser therapies, Er:YAG laser treatment offers more favorable results.

Er:YAG resurfacing is a highly precise, simple, and effective method of treating linear epidermal nevus, which can be repeated if lesions should reoccur.

A close-up photograph of a person's face, focusing on the eyes and nose. The person's eyes are closed, and their mouth is slightly open. The skin appears fair and has a natural texture. Overlaid on the image is the text "CLINICAL CASES" in a large, bold, red, sans-serif font. The text is centered horizontally and spans across the middle of the image, partially covering the nose and eyes.

CLINICAL CASES

By Dr. Mia Volovec

# Combined Laser Treatment of Port Wine Stains

We have observed the complete removal of the lesion in some areas and a significant reduction of the lesion's color in the others.

**Parameters**

Laser source:	532 nm Q-sw KTP	1064 nm LP Nd:YAG
Spot size:	3 - 4 mm	4 mm
Fluence:	2.5 - 4.7 J/cm2	220 - 240 J/cm2
Frequency:	2 - 5 Hz	2 Hz
Handpiece:	R28	R28



Before treatment

Immediately after treatment

After 8 treatments

**Treatment procedure**

A healthy, 41-year-old female, Fitzpatrick skin type 2, with facial PWS was treated in the clinic with the aim of completely removing the facial lesion.

On her initial presentation, the port wine stain was red to dark purple and was distributed in the area of the first and second branch of the trigeminal nerve on the left side of the face. The patient claimed to have no known allergies or other diseases.

The treatment had to be adapted to the patient's needs due to her inability to take free days off of work and her desire to have longer session-free periods than recommended. Until now, we have completed 12 treatment sessions in 2 and a half years. Initially, the interval between sessions was one month, and later 2-4 months. The first nine treatments were done with Q-s 532 nm KTP laser (QX MAX, Fotona, Slovenia). In the following 3 treatments, long-pulse Nd:YAG (SP Dynamis, Fotona, Slovenia) was added after Q-s KTP.

No anesthesia was applied before the treatment, however, during each session, simultaneous cooling together with ice-packs was applied to minimize the pain and epidermal damage. The patient was advised to use 0.5 mg/1 mg betametazon/gentamicin cream (Diprogenta) together with cooling/ice packs for 2 to 3 days after the treatment to prevent inflammation and swelling.

We used the R28 handpiece for the Q-Switched KTP laser and the R33 handpiece for the long-pulse Nd:YAG laser. Only 1 pass with no overlapping was performed in each session. The parameters are listed in the table below.

The treatment was tolerated well by the patient. She reported a slight burning sensation for 30 minutes after the treatment and moderate edema of the face for the next 2 to 3 days. Redness of the treated area developed immediately after the treatment and subsided gradually in the following 2-3 weeks, especially after 1 one week, when the treated epidermis peeled off and only minor redness resided.

The treatment has revealed excellent results. We have observed the complete removal of the lesion in some areas and a significant reduction of the lesion's color in the others. As the PWS began to fade during treatment, a few small nodular lesions, resembling hemangiomas or small pyogenic granulomas, became apparent. These weren't responding to KTP Q-Switched treatment, hence, a long-pulse Nd:YAG laser has been introduced following the 8th session to target these nodules. The nodules subsided gradually after each session.

By Yana Targonskaya, MD

# Combined Er:YAG Laser Acne Scar-Revision Treatment

A patient, previously treated with isotretinoin came in for scar revision treatment. Results after 4 treatments were fascinating.

**Parameters**

Laser source:	Er:YAG, 2940 nm		
Treatment:	1-3		4
Pulse duration:	SP	SP	SP
Fluence:	7 J/cm <sup>2</sup>	28-56 J/cm <sup>2</sup>	70 J/cm <sup>2</sup>
Frequency:	3-4 Hz	-	-
Handpiece:	R-11, 3 mm spot size	FS-01	FS-01
Density / coverage:	-	5%	5%

**Treatment procedure**

22-year-old patient, previously treated with isotretinoin for a year came in for scar revision treatment. He did not have any acute acne at the time of the first treatment. Before the treatment, a thick layer of 5% emulsion lidocaine/prilocaine preparation was applied to the treatment area for 30 minutes, covered with occlusion dressing. Four treatments were performed. We started the treatment with R-11 handpiece, with 3 mm full spot size at 7 J/cm<sup>2</sup>, up to 4 Hz repetition rate, ablating only the edges of the scars. We

continued with fractional FS-01 handpiece at 56 J/cm<sup>2</sup>, up to 2 Hz, Turbo 4, 5% coverage, SP, treating both already ablated surfaces as well as the bigger pits. Remaining affected area was then treated with 42 J/cm<sup>2</sup>, Turbo 3, up to 2 Hz. Outer edges of the scarred area were finished with 28 J/cm<sup>2</sup>, Turbo 2, 1 Hz. In 2 following treatments we kept smoothing remaining edges of the pits, while increasing the parameters each time, where the last treatment had the highest parameters of 70 J/cm<sup>2</sup>, Turbo 5, 2 Hz, 5% coverage, SP.



Before scar-revision treatment



After 4 treatments

By Abhijit Desai, MD

# Efficient Hair Reduction with FRAC3

**Woman treated for hair reduction**

A female patient of skin type V with light and fine hair around the ears was treated for hair reduction using Nd:YAG laser (SP Dynamis, Fotona, Slovenia). The non-ablative fractional FRAC3 method was used, which utilizes the fractional nature of the selective photo-thermolysis at short laser pulse durations. The method has been found to be highly applicable for hair reduction treatments, since the shorter pulse widths allow selective heating of the hair follicle without overheating the epidermis. FRAC3 uses sub-millisecond 1064 nm Nd:YAG, which is especially suitable for patients with thinner and lighter hair, in which the TRT and absorption in hair follicles are the lowest.

**A suitable method for darker colored skin**

The hair reduction was performed with the Nd:YAG laser in FRAC3 mode, using an S-11 scanner with a sequential scanning pattern using a 3 mm spot and 0.3 ms long pulses. Three sessions were performed with 25 J/cm<sup>2</sup> and a frequency of 6 Hz. Although pain was minimized in comparison to long-pulsed Nd:YAG treatment, air cooling (Zimmer Cryo 6) was still used to additionally reduce the patient's discomfort. A virtually complete removal of unwanted hair was observed after only two sessions. The treatment was well tolerated by the patient, who was highly satisfied with the treatment results. This method is very suitable for darker colored skin (types IV and V), where long-pulsed treatments are more often associated with patient discomfort and occasional adverse effects, such as burns and hypopigmentation.

A virtually complete removal of unwanted hair was observed after only two sessions.



Nearly complete hair removal was observed after 2 sessions, 3 month after the start of the treatment.





## One family together

**1.** Nina Malej Primc congratulates Harvey S. Shiffman, DDS, for becoming an Expert Lecturer at the LA&HA Symposium. **2.** Which novelties is Dr. Kresimir Simunovic showing to practitioners at the LA&HA Workshop in Zürich? **3.** This is how it works in practice! Zdenko Vizintin (far left) and Dr. Marco Gambacciani (far right) with attendees at the LA&HA Institute's Opening Workshop. **4.** The showroom is an important feature of the LA&HA Institute. Guests gathered around the showcase at the Opening event. **5.** Dr. Giovanni Olivi showing new methods in Dentistry to attendees of the LA&HA Master's Program Module in Rome. **6.** All work and no play makes Jack a dull boy. Our attendees of the LA&HA Master's Program Module in Rome can confirm that!

**7.** Dr. Matjaz Lukac, CEO of Fotona, listening to guests at the LA&HA Institute's Opening event. What are they saying about the Institute? **8.** We take great care of our Fotona Family: education, good food and great company guaranteed! The LA&HA Institute Opening was no exception! **9.** Sharing knowledge is our mission, because we believe that sharing is caring. Guests listening to the welcome speech at the LA&HA Institute's new lecture room for more than 100 people. **10.** Dr. Leonardo Marini addresses guests from all over the world who gathered in Ljubljana for the LA&HA Institute's Opening event. **11.** Dr. Matjaz Lukac, CEO of Fotona, and Dr. Masa Gorsic Krisper, head of the LA&HA Institute, cutting the red ribbon. The new Institute is officially open! **12.** The LA&HA Institute is a place for sharing knowledge - Dr. Leonardo Marini with guests at the Institute's Opening.



**13.** LA&HA Masters' Program: top lecturers, incredible participants, one of the best training institutes in the world! **14.** Chinese proverb: "Learning is a treasure that will follow its owner everywhere". And who knows that better than clinicians from an aesthetic clinic in Beijing. **15.** You say 'Cheese', we say 'Cheers' to the crew from Shanghai! **16.** From East to West, from North to South, from Europe to China ... Welcome to the Beijing satellite meeting! **17.** A group photo is an absolute must at every Fotona meeting! This one is from the official Fotona4D and TightSculpting launch in China. **18.** LA&HA Expert lecturers Wong, Simunovic and Seto at a dental symposium in Hong Kong.

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