

QX MAX Provides Pico Performance in a Nano System



Mark B. Taylor, M.D.
Gateway Laser Center
Salt Lake City, UT



Zdenko Vizintin
Medical Laser Program Director
Fotona
Ljubljana, Slovenia



Jennifer Kish, D.O.
Seriously Skin
Cleveland, OH

“Unlike many other devices, QX MAX actually delivers the fluence, duty cycle and beam quality the manufacturer claims, which is optimized for the specific application.”

By Kevin A. Wilson, Contributing Editor

Tattoos have never been more popular, and while tattoo removal has long been a staple offering in many medical aesthetic practices, it has experienced a corresponding rise in popularity. Simultaneously, the modern aesthetic physician is always looking for versatile technologies that allow them to perform additional therapies, providing maximum capability at minimal cost, as long as performance is not sacrificed.

QX MAX, manufactured and sold by Fotona (San Clemente, Calif. and Ljubljana, Slovenia) combines power, performance, efficiency and speed, offering high-energy single pulse technology, a variety of pulse modes and four treatment wavelengths: 1064 nm Nd:YAG, 532 nm KTP, 650 nm and 585 nm dye, with various spot size options. The QX MAX laser beam is carefully crafted to provide an almost perfectly homogeneous flat beam profile, reducing the risk of unwanted side effects. This not only gives users the optimal tool for tattoo removal, it serves as a go-to laser for frontline therapeutic demands such as pigment and vascularity, as well as emerging uses for managing acne and recalcitrant melasma. “Unlike many other devices, QX MAX actually delivers the fluence, duty cycle and beam quality the manufacturer claims, which is optimized for the specific application,” said Mark B. Taylor, M.D., of the Gateway Laser Center in Salt Lake City, Utah.

For tattoos and pigment, QX MAX sets a new standard for high performance and expanded capabilities, according to Zdenko Vizintin, medical laser program director at Fotona. “What we are looking at is high peak power and premium beam quality in an effective, optimized nanosecond pulse. This improves the photoacoustic effect, which is key when ‘shattering’ pigment. The current picosecond competition uses an alexandrite laser, which has tattoo color limitations, and touts a slightly sub-nano pulse (about 750 picoseconds), while QX MAX is based on a next-generation Nd:YAG laser providing four wavelengths that address the spectrum of pigment colors. Additionally, other devices are limited to spot sizes approaching 4 mm, whereas the QX MAX provides clinically useful treatment spots as large as 8 mm without losing efficiency, and allowing for greater penetration of the laser energy with each pulse.”

Fotona’s new proprietary Vacuum Photon Cell Technology (VPT™) is a major element of the QX MAX. VPT preserves and delivers more energy to tissue and provides a flat, uniform beam profile. “Having a uniform flat beam profile prevents the hot spots in energy delivery across the beam which may account for problems such as pinpoint bleeding,” Mr. Vizintin explained. This technology is combined with QX MAX’s unique and compact OPTOflex articulated arm, which enhances precision transmission of laser energy while promoting ergonomic, hand motion flow during use.

An exclusive feature of the QX MAX is the Accelera mode, which provides long-pulse capability, promoting penetration and photothermal effect useful for other indications such as skin tightening, onychomycosis and vascular lesions. “We primarily use QX MAX as a tattoo and pigment workhorse, but have found it eminently useful for acne using the Accelera pulse,” Dr. Taylor said. “By extending the length of the pulse with the Nd:YAG laser, we get deeper penetration into

inflammatory lesions. We perform daily treatments (10 J/cm² at 2.2 Hz and 8 mm spot with multiple passes) over three or four days to dramatically reduce the appearance of serious inflammatory outbreaks; we aren't sure about the mechanism of reducing inflammation or causing death of *P. acnes* bacteria, but the clinical result can be seen on a daily basis. This helps us get the problem under control quickly for new patients, before adding the usual treatment regimen, or for existing patients when things get out of hand. Treatment is painless."

Dermatologist Jennifer Kish, D.O., with Seriously Skin in Cleveland, Ohio, relies on QX MAX for tattoos, but enjoys its unique capabilities in treating refractory melasma. "In Ohio we tend to see patients who don't worry about their melasma during the winter, but see it worsening once sun exposure increases," she explained. "The offending melanocytes and melanin deposits tend to congregate at the same level as tattoo ink so we use the Q-switched mode to attack it directly in a similar way. We see dissipation of pigment in patients who may prove difficult to treat with traditional therapies. In my region nobody else seems to offer this. Moreover, QX MAX for melasma fits into patient lifestyle more effectively than ablative alternatives, she noted. "Patients may be pink for 15 or 20 minutes, but can go back to putting on make-up when they get home with no significant downtime."

For Dr. Kish, the manufacturer's study of the device, which included a lot of reliable trials of Asian skin, gave her confidence in its ability to treat without exacerbating the condition. She starts at 10 Hz with the 3 mm spot from 1.7 J/cm² to no higher than 3 J/cm². "We see great results at 2 to 2.5 J/cm²."

Recently, FRAC3[®] Technology has been incorporated into QX MAX, further expanding its applications. As Mr. Vizintin explained, "what FRAC3 does is harness a temporal energy spiking effect that naturally occurs as we shorten long pulses into the microsecond, high peak power range. These spikes provide a thermal profile more like a fractional treatment, but in three dimensions. While it's not technically a fractionated beam, it still provides a similar effect, creating a three-dimensional matrix of thermal damage, but sparing surrounding tissue." This is enhanced when treating tissue structures within the skin, which have different thermal relaxation times. "We've found this particularly good for skin tightening and effective hair removal."

Efficiency with QX MAX also applies to the laser itself, Mr. Vizintin added. "Typically, the pulse repetition rate in other devices is fixed at 10 Hz in order to prevent undesirable beam deformations when pulse repetition rate is varied," he pointed out. "In standard devices, when a lower therapeutic rate is needed, a shutter is used to block laser pulses to the skin. This can result in up to 90% of laser pulses never reaching the skin. This generates unnecessary heat, wastes energy and shortens the life of the flashlamp and laser system. With QX MAX and OPTOFlex technology we have discovered how to alter the speed of pulse generation, so about 95% of generated pulses are utilized for therapy. This reduces heat generation, increases performance, capability and lifetime of the system, and QX MAX is less costly to operate and maintain."



Inflammatory acne before Tx



Inflammatory acne after five QX MAX treatments

Photos courtesy of Mark B. Taylor, M.D.