

# LightWalker

Hard and Soft-Tissue Dental Lasers



# Virtually Unlimited Applications

## From Dentistry to Aesthetics

LightWalker lasers are designed for ultimate versatility, with one of the most comprehensive lists of clinical applications available on any dental laser. With both tipped and tipless handpieces, your clinical options are endless. LightWalker offers the highest standard of dental treatment, and at the same time simplicity of use in:

- Conservative dentistry,
- Endodontics,
- Periodontics,
- Soft-tissue surgery,
- Implantology,
- Aesthetic treatments.

### Presettings for 80 Different Applications

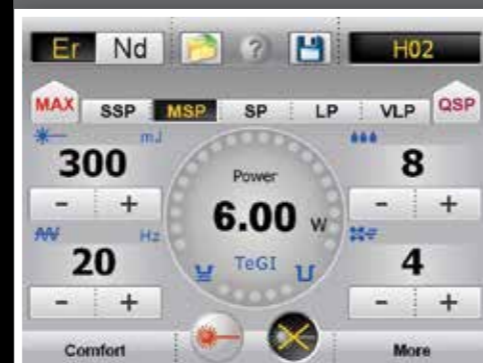
The LightWalker touchscreen offers a simple menu of pre-programmed laser treatments. You select the treatment and the laser automatically sets your optimum starting parameters. With easy-to-follow protocols and touch-of-a-button treatment settings, you'll be able to perform every dental procedure with confidence and high success rates, bringing in extra income to your practice along the way. You can even upgrade the AT model to perform aesthetic skin treatments such as skin rejuvenation and removal of benign and vascular lesions.



The four main application groups



Comfort window for routine daily procedures



Advanced window to fine tune specific procedures



LightWalker

# No Compromise – Dentistry's Two Optimal Laser Wavelengths

## Two lasers for superior clinical results

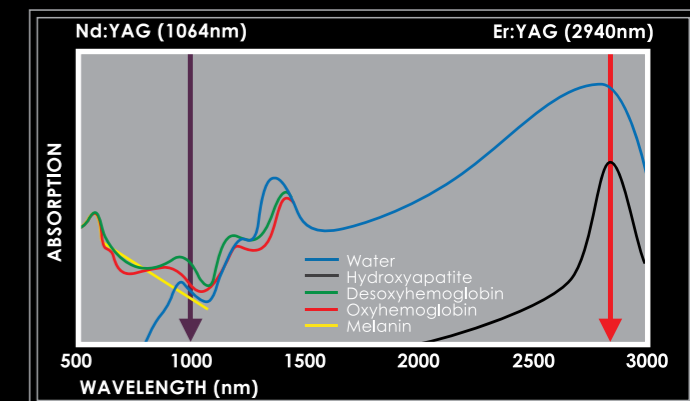
The LightWalker models AT and DT come standard with dentistry's two most effective laser wavelengths: Er:YAG and Nd:YAG for no-compromise dentistry with a touch of the control screen.

### Universal Laser System

It is a well-established fact that different dental procedures require different laser wavelengths. Wavelength is important because specific oral tissues react in different ways depending on the particular laser source. With the choice of two complementary wavelengths (in terms of their effect on tissues) LightWalker comes very close to being a "universal" laser. Practically all laser-assisted dental treatments can be performed with either the most highly absorbed Er:YAG laser wavelength or the most homogeneously absorbed Nd:YAG laser wavelength.

### TwinLight® Treatment Concept

The combination of the two best wavelengths in one laser system enables practitioners to perform not only single-wavelength but also dual-wavelength (TwinLight®) treatments. Utilizing both wavelengths in a treatment makes optimum use of the unique laser-tissue interaction characteristics of each wavelength. For example, Nd:YAG laser energy is superior for coagulation and deep disinfection while Er:YAG is uniquely efficient at ablating hard and soft tissues. Combined, they can greatly expand the range of treatment possibilities and dramatically improve the outcome of laser-assisted treatments.



Absorption spectrums



Frenulotomy  
(Er:YAG and Nd:YAG)



# Exceptional Power and Range of Pulse Modes

Technology for efficacy and safety

In LightWalker, both “gold standard” laser wavelengths are produced by solid crystal lasers that can significantly outperform diode lasers in terms of peak power and the range of pulse durations.

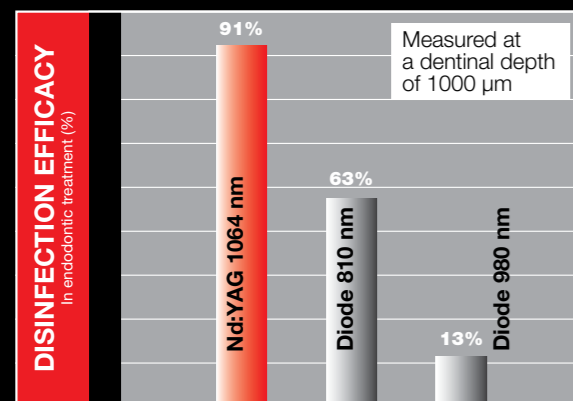
## Fast efficient cutting with unmatched patient comfort

With the advent of QSP technology and higher output power (several kW), the LightWalker ATS has established a new standard for ablation/

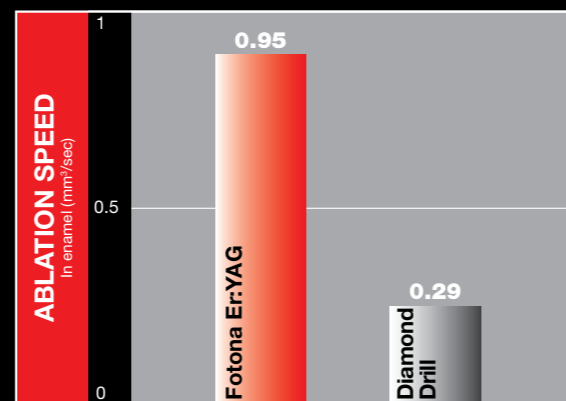
cutting speed. This new accelerated cutting speed provides today’s dentists with the speed and precision they demand, while simultaneously increasing patient comfort.

## Precise tissue surgery with simultaneous disinfection

The homogeneous absorption of the Nd:YAG laser in soft tissue results in controlled tissue vaporization with simultaneous coagulation for superior healing and disinfection.



Disinfection efficacy: Nd:YAG vs. other lasers \*



Cutting speed: Er:YAG vs. diamond drill \*\*

\* Diode Laser Radiation and Its Bactericidal Effect in Root Canal Wall Dentin. NORBERT GUTKNECHT, DIRK VAN COGSWAARDT, GEORG CONRADS, CHRISTIAN APEL, CLAUD SCHUBERT, and FRIEDRICH LAMPERT. *Journal of Clinical Laser Medicine & Surgery*. April 2000, 18(2): 57-60. doi:10.1089/clm.2000.18.57.

Antibacterial Effects of Nd:YAG Laser Irradiation within Root Canal Dentin. THOMAS KLINKE, WOLFGANG KLIMM, and NORBERT GUTKNECHT. *Journal of Clinical Laser Medicine & Surgery*. FEBRUARY 1997, 15(1): 29-31. doi:10.1089/clm.1997.15.29.

Bactericidal Effect of a 980-nm Diode Laser in the Root Canal Wall Dentin of Bovine Teeth. N. GUTKNECHT, D.D.S., Ph.D., R. FRANZEN, M. SCHIPPERS, and F. LAMPERT, D.D.S., Ph.D., *Journal of Clinical Laser Medicine & Surgery*, Volume 22, Number 1, 2004, Pp. 9-13

\*\* Ablative potential of the erbium-doped yttrium aluminium garnet laser and conventional handpieces: A comparative study. A. BARABA et al., *Photomed Laser Surg*. 2009;27(6):921-927.



X-Runner cutting



# The Technology Behind an Award-Winning Dental Laser

Solutions for experts as well as beginners

The development of LightWalker is based on Fotona’s 50 years of experience in laser technology. The LightWalker system has technologically advanced laser elements that are engineered for ultimate performance in the world of dentistry:



## Variable Square Pulse (VSP) Technology

Fotona’s VSP technology sets the precision and safety of dental laser treatments on a higher level. Fotona’s square-shaped laser pulses avoid standard laser technologies’ slow rise and even longer fall in pulse power. VSP ensures ultimate patient comfort in all your treatments and unrivaled ease-of-use.

## Energy Feedback Control

The laser system incorporates a sophisticated double channel safety structure for energy regulation, which contributes to procedure safety. The laser output energy is constantly regulated by a signal from two energy meters.

## Quantum Square Pulse (QSP)

By avoiding the hard-tissue debris cloud the laser ablates more efficiently and with greater precision in Fotona’s patented QSP mode because the laser beam is not affected by the debris. By being able to ablate more efficiently, the edges of individual craters are sharp and consistent, providing higher levels of precision and preservation in hard-tissue treatments.

## Tissue Effect Graphical Interface (TeGI)

The Tissue Effect Graphical Interface (TeGI) provides a graphical representation of the laser tissue effect, maximizing ease-of-use and shortening the learning curve.



# Convenience in Use

## Designed with the dentist in mind



### Easy-to-use touch screen

LightWalker has an easy-to-use color touch-screen with an adjustable tilt and 80 customizable presettings that cover more than 40 different applications.

### Easy access spray/heated water reservoir

The integrated spray water container means that you don't have to rely on any water mains outlet, making your laser system exceptionally mobile and hassle-free. The container is handily located at the back of the system for easy refilling access. Additionally, the water is heated to body temperature, avoiding cold sensitivity reactions during procedures.

### Patented weightless OPTOflex® arm (available with LightWalker AT)

LightWalker's unique and patented OPTOflex® Er:YAG articulated arm is designed to transmit a high-power laser beam to the handpiece, while maintaining the quality of the laser beam to ensure precision and repeatability even at the highest settings.

The OPTOflex® arm is perfectly balanced during use, making handpieces completely weightless in your hand. OPTOflex® allows a full range of motion and a maximum degree of control as it makes maneuvering the handpiece much smoother, which improves treatment precision and ease.

### Wireless footswitch

LightWalker also has an optional wireless footswitch that avoids unnecessary tangling of electric cables on your practice floor.



# Supreme Clinical Results

## Designed with the patient in mind

### Shorter and More Effective Treatments

With LightWalker, procedures are typically shorter, easier to perform and more effective. Laser treatments are by nature minimally invasive, and LightWalker takes this concept to a new level.

### Patient Comfort

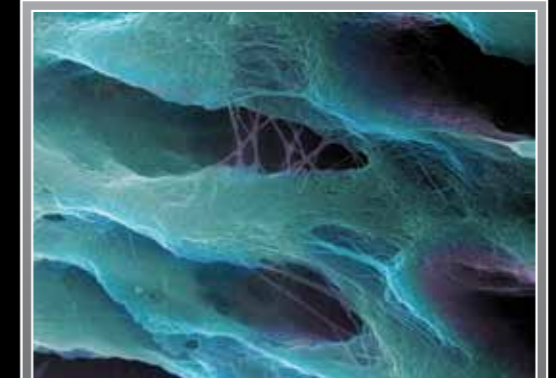
Working with LightWalker is less stressful for the patient because pain and bleeding are minimal if any. LightWalker lasers are so gentle for cavity preparations and most soft-tissue procedures that patients rarely require any anesthetic. Laser light allows you to work in a non-contact way and without drilling noise, which is far more comfortable for patients, especially children. LightWalker also allows you to achieve simultaneous disinfection and prevention of cross-contamination.

### Unmatched Flexibility

The Nd:YAG laser source is ideal for root canal disinfection, soft-tissue crown lengthening and numerous other applications. And LightWalker's Er:YAG laser is compatible with a set of over 20 specialized fiber tips, expertly designed to offer advanced options in conservative dentistry plus an additional range of lucrative, high quality treatments in endodontics, periodontics, and implant recovery, areas you may otherwise have to refer out to specialists.

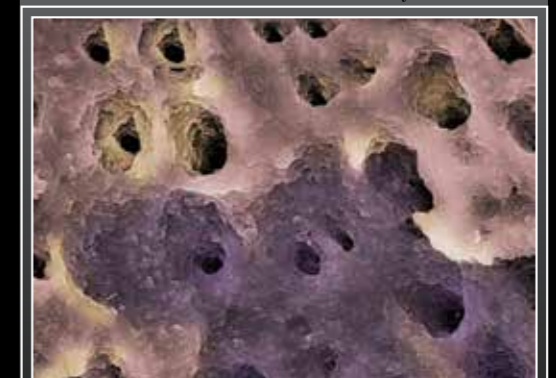


Intact collagen fibers after laser treatment.



Preserved collagen fibrils of the intertubular dentin at the entrances to the dentinal tubules.

Courtesy of MDATG, LLC



After endodontic laser treatment the dentinal tubules are disinfected and fully open.



Direct pulp capping

# TwinLight® Endodontic Treatment

# TwinLight® Periodontal Treatment

Simple, gentle and powerful

WPT - Wavelength-optimized Periodontal Treatments

HARD TISSUE: Procedure Open		
11	Er:YAG SURFACE MODIFICATION	H02
12	Er:YAG PULP CAPPING	H02
13	Nd:YAG NECK DESENSITIZATION	300
14	Er:YAG ENDO CLEANING	H14
15	Nd:YAG ENDO DEEP DISINFECTION	200

The Fotona TwinLight® Endodontic Treatment successfully addresses two major disadvantages of classical chemo-mechanical procedures: the inability to clean and debride anatomically complex root canal systems and to deeply disinfect dentinal walls.

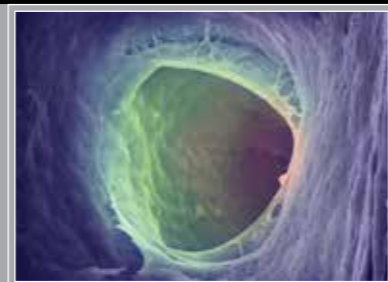
In the first step of the TwinLight® treatment, a revolutionary photoacoustic streaming method is employed, which uses the power of the Er:YAG laser to create non-thermal photoacoustic shock waves within the cleaning and debriding solutions introduced in the canal. Following this treatment, the canals and subcanals are left clean and the dentinal tubules are free of a smear layer.

This powerful photon-induced photoacoustic streaming method, which is available only with Fotona lasers, is equally effective for final water rinsing prior to obturation.

In the second step, the deeply penetrating Nd:YAG laser wavelength is utilized to decontaminate dentinal walls up to 1000 µm deep. In this step, the high peak-pulse power of the Nd:YAG laser plays an important role as it induces maximum temperature pulsing for eliminating bacteria.



TwinLight® endodontic treatment



Following endodontic laser treatments with photoacoustic streaming, there is no smear layer around the opening of the lateral canal.



In the first step, Er:YAG laser light cleans and debrides the canals and subcanals.



In the second step, the Nd:YAG laser deeply disinfects the dentinal walls.

SOFT TISSUE-PERIO: Procedure Open		
1	Nd:YAG PERIO EPITHELIUM	300
2	Er:YAG PERIO CALCULUS	H14
3	Nd:YAG PERIO CLOT CREATION	300
4	Er:YAG FLAP SURGERY	H14
5	Er:YAG GINGIVECTOMY	H14

TwinLight® Periodontal Treatment is a minimally invasive periodontal disease therapy incorporating dentistry's two best laser wavelengths.

The TwinLight® approach enables wavelength-optimized treatments for periodontal therapy (WPT™), which create favorable conditions for healing periodontal tissues by removing the diseased epithelial lining of the periodontal pocket, removing microbial biofilm and calculus from the root surface and sealing the pocket after treatment with a stable fibrin clot.

The TwinLight® Periodontal Treatment approach gives general dentists the confidence to treat their patients' moderate-to-severe periodontal disease the laser way, without scalpels and sutures.



TwinLight® periodontal treatment



Step 1: the Nd:YAG laser removes the diseased epithelial lining and improves access to the root surface.



Step 2: Er:YAG is used to thoroughly remove calculus from the root surface.



Step 3: Nd:YAG laser energy is used to coagulate and leave a stable fibrin clot.

# TwinLight® Peri-implantitis Treatment

Fast and easy to perform



TwinLight® Peri-implantitis Treatment combines dentistry's two best laser wavelengths, Er:YAG and Nd:YAG, to significantly enhance treatment success rates and shorten healing time.

Removal of granulation tissue from the alveolar bone and connective tissue with Er:YAG laser is selective. The bactericidal effect of Er:YAG on the surgical site is highly effective and the implant surface is completely cleaned without chemicals. The subsequent Nd:YAG treatment step promotes faster healing by decontaminating and biomodulating the tissue. Inflammation, swelling, and bleeding of soft-tissue lesions, which may lead to bone loss, can be handled without surgery, and healthy peri-implant tissue assures greater long-term implant success.

Gentle treatment with LightWalker assures that the highly fragile bone surrounding the implant remains intact. Because the Er:YAG wavelength with LightWalker is used in a safe mode, there is no danger of thermal damage to the surrounding bone and no significant alterations of the implant surface, as is caused with other lasers. There is no mechanical, chemical or any other means of trauma during the entire treatment.



Peri-implantitis treatment



Removal of the soft-granulation tissue and ablation of the infected bone with Er:YAG



Removal of the bacterial biofilm on the implant surfaces with Er:YAG



Bacterial reduction and biostimulation of the bone tissue with Nd:YAG (never expose the implant surface to the Nd:YAG laser beam).

# TouchWhite® Laser-Assisted Tooth Whitening

Shorter, patient-friendly treatments



TouchWhite® patented tooth whitening makes use of the fact that the Er:YAG laser wavelength has an absorption peak in water, which is the major component of aqueous bleaching gels. This eliminates the need for any additional absorbing particles in the bleaching gels. More importantly, taking into account thermal burden considerations, the TouchWhite® procedure represents the most effective and least invasive laser-assisted tooth whitening method possible.

Due to its high absorption in bleaching gels, the Er:YAG laser beam is fully absorbed in the gel and

does not penetrate to the hard tissue or the pulp. All of the laser energy is thus effectively used for the heating of the gel. There is no direct heating of the dental tissue and the pulp, as is the case with other laser-assisted whitening methods. There is also no risk of accidentally damaging the hard dental tissue as the laser fluence of every laser pulse is set to be significantly below the ablation threshold for dental tissues. As a consequence, the procedure can be performed with a minimal undesirable thermal burden on the tooth, and the tooth whitening speed can be safely increased by 5 – 10 times.



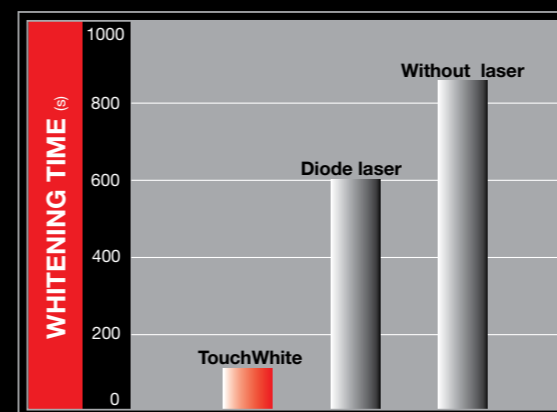
Before (A3 VITA Shade Guide)



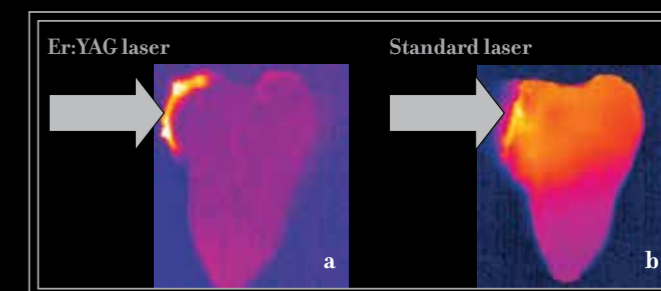
Bleaching gel is applied to the teeth.



Immediately after (A1 VITA Shade Guide)



TouchWhite® Tooth Whitening substantially shortens the whitening process.\*



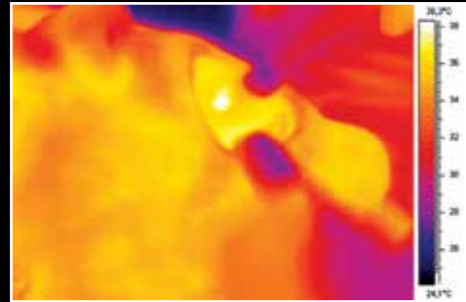
With TouchWhite® whitening, only the gel is heated (a) while with standard laser whitening the entire tooth is heated (b).

\*JLA&HA 2011, No 1 Gutknecht N. et al, A Novel Er:YAG Laser-Assisted Tooth Whitening Method

Courtesy of Dr. Jovanović

# NightLase® Snoring and Apnea Treatment

A non-invasive method for better quality sleep



Step 1: PRECONDITIONING



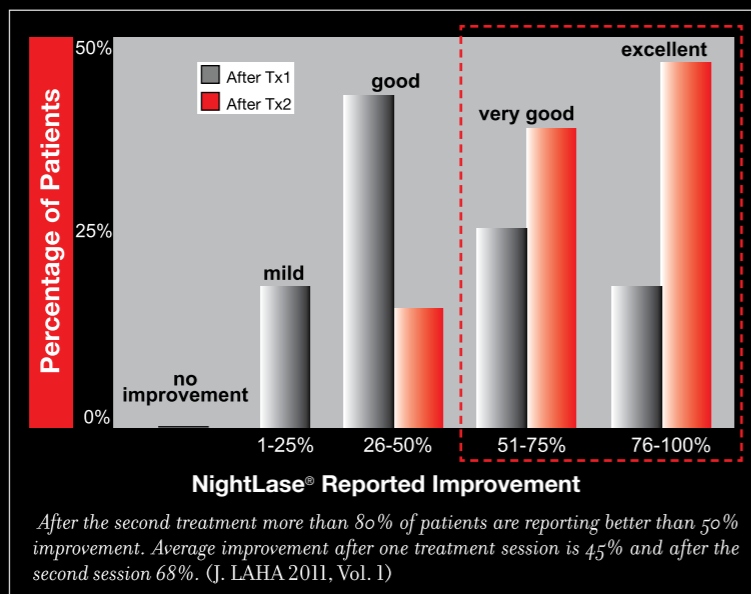
Step 2: TISSUE STRENGTHENING

NightLase® Treatment is a patented, fast, non-invasive and friendly way of increasing the quality of a patient's sleep. NightLase® lessens the effects of sleep apnea and decreases the amplitude of snoring through the use of gentle, superficial Er:YAG laser light. No anesthesia is used in this treatment.

During NightLase® treatment laser light gently heats the tissue, causing tightening of the tissue without damage or adverse effects. It is gentle

enough to be used on the sensitive tissue inside the mouth, but strong enough to provide clinically efficacious heating.

NightLase® is easy for any doctor or dentist to perform and has a high success rate in producing a positive change in sleep patterns. Research has shown that NightLase® reduces and attenuates snoring and provides an effective, non-invasive way to lessen the effects of sleep apnea.



NightLase  
snoring treatment

# What doctors are saying about LightWalker



"I lecture about laser surgery around the world; I use only the best technologies and those that increase the bottom line for my practice. I trust in the ability for Fotona to bring me those technologies. Their experience in laser dentistry is unmatched and the lasers they provide for today's clinician are of the highest quality anywhere in the world. The characteristics of the lasers they provide give me a big advantage in speed, control and results."

Robert Miller, MA, DDS, FACD, DABOI



"The LightWalker generation represents a remarkable, and indeed a historical step forward in science and technology for laser-assisted dentistry. The ergonomic benefits, due to the completely new and easy-to-manuever OPTOflex articulated arm, the interactive adjustable panel with fast menu access and easy, complete clinical guidance, and the choice of ready-to-use Nd:YAG fibers for both sizes at the same time, are truly unique features, which allow for comfortable and efficient chair-side work, fully focusing on the patient's need, considered as a pillar of evidence-based dentistry."

Kresimir Simunovic, DMD, MSc



"I would highly recommend the LightWalker, its Durability and Mobility allow for a wide arrange of daily tasks. The low maintenance especially is helpful for the daily work horse like myself, making it virtually self proficient. I specifically find the low drag and high efficiency delivery systems remarkable. Another great feature that is exceedingly convenient, is that it is comfortably quiet in its operation... the fan noise is typically loud in lasers. However, the most vital attribute is the LightWalker's dual wavelength versatility to perform the full spectrum of laser dental procedures. I own several lasers and have found that overall, it is widely accepted and preferred by myself, staff and my patients."

Dr. Scott R. Neish DMD



The LightWalker is the easiest, most efficient, clean cutting laser I have ever used. Having both the Er:YAG and Nd:YAG wavelengths in one system easily allows you to switch from one procedure to another at the touch of a button. I have found that performing PIPS with the LightWalker dramatically improves my ability to do endodontics by making it easier and faster, with much better results. I have cut down the amount of time it takes for me to perform a routine endodontic cases by more than 25% and PIPS allows me to clean and debride the root canal system in a three dimensional fashion.

Mark Colonna, DDS



Photon-induced photoacoustic  
NaOCl streaming with Er:YAG



LA&HA magazine  
March, 2015, 4



# LightWalker Range

# Advanced Easy-To-Use Handpieces

## Laser model comparison chart

System	AT S / AT	DT			ST-E			
Er:YAG	Power	20 W	Basic 8 W	Standard 10 W	Advanced 18 W	Basic 8 W	Standard 10 W	Advanced 18 W
	Integrated spray	✓		✓	✓		✓	✓
	Energy	1500 mJ	500 mJ	500 mJ	900 mJ	500 mJ	500 mJ	900 mJ
	Operational modes	MAX, QSP (up to 120 Hz) SSP, MSP, SP, LP, VLP, SMOOTH	SSP, MSP, SP, LP, VLP			SSP, MSP, SP, LP, VLP		
	Optical delivery	OPTOflex	7-mirror arm			7-mirror arm		
Nd:YAG	Power	15 W	8 W	8 W	15 W			
	Operational modes	MSP, SP, VLP 15 ms, 25 ms	MSP, SP, VLP					
	Optical delivery	Dual fiber system	Single fiber system					

AT S and AT models additionally offer: Fotona's new digitally-controlled handpiece mode, automatic handpiece detection, quick-disconnect Er:YAG handpieces, advanceable and disposable Nd:YAG fiber-feed handpieces, and heated water spray for enhanced patient comfort. AT S models are equipped with a green pilot beam.



### Titanium Technology

LightWalker uses advanced titanium handpieces which provide ultimate durability for constant handling and frequent sterilization.

### Er:YAG

Both tipped and tip-less Er:YAG handpieces have an integrated air/water spray for additional patient comfort. The Er:YAG handpieces also have a quick disconnect system for greater convenience and easier sterilization.

### Nd:YAG

The Nd:YAG handpieces are now more convenient than ever. With LightWalker AT you have two constantly available handpieces with two different fiber diameters at your disposal. What's more, LightWalker AT has an automatic handpiece detection system which knows exactly which handpiece you have selected and automatically sets the appropriate laser parameters.



Hemangioma removal (Nd:YAG)



# LightWalker Accessories

# The First Digitally Controlled Dental Laser Handpiece



H02

Tipless (non-contact), 90°-angled Er:YAG handpiece



R17

Tipless, non-contact Er:YAG straight handpiece with a collimated beam at 5 mm spot size



H14

90° degree tipped Er:YAG handpiece and straight tipped Er:YAG handpiece



R21-C3

300 µm fiber-optic Nd:YAG handpiece



R09-3

Tipless, non-contact Er:YAG straight handpiece with a collimated beam at 5 mm spot size for DT and ST-E



R21-C2

200 µm fiber-optic Nd:YAG handpiece



R02

Tipless, non-contact, 90° angled Er:YAG dental handpiece for DT and ST-E



R24-C

Collimated fiber optic Nd:YAG handpiece with a 6 mm spot size



R14

90° angled Er:YAG dental handpiece for DT and ST-E



R21-A

200 & 320 µm fiber-optic Nd:YAG handpiece for DT



R15

Dermatological, straight handpiece, with collimated 3mm spot size



R30-A

Nd:YAG aesthetic and dermatological handpiece with a variable 2 to 8 mm spot size



R16

Dermatological, straight handpiece, with collimated 7 mm spot size



PS04

Pixel structure Er:YAG handpiece



X-Runner

LightWalker AT is the first dental laser system that works with a digitally controlled dental handpiece. Fotona's revolutionary X-Runner® technology increases the precision of dental laser treatments by helping to swiftly and accurately guide the laser beam across the treatment area according to perfectly shaped, predefined patterns.

### Unmatched Precision

X-Runner® replaces multiple dental tools and makes treatments more precise, simple and easy. It provides precise, consistent and even ablation in hard or soft tissue over a 6x6 mm surface. With X-Runner®, the shape and size of the treatment area are selected in advance, allowing practitioners to perform treatments with a level of speed and consistency that is virtually impossible to achieve with any other tool.

### Walk into the Future with LightWalker

LightWalker technology is enabling practitioners to utilize the most important feature of laser light – its weightlessness. The new X-Runner® digitally controlled dental handpiece is a major advance in laser dentistry that will greatly impact fields such as surgery, conservative dentistry and implantology.



After precise and fast ablation with X-Runner



Samples of easily achievable scanning patterns in hard tissue drilling and cutting.

# Advanced support for your dental laser practice

## International workshops in laser dentistry

- led by leading international laser experts
- live demos and hands-on
- explore all areas of laser dentistry
- great experience-sharing opportunity

To get the most out of your LightWalker system, our practitioner workshops, coorganized with the Laser and Health Academy, provide hands-on demonstrations of our lasers from international clinical experts. Fotona also works closely with other leading educational authorities in the field of laser dentistry to offer additional high level training opportunities to help you on your path to becoming a top laser specialist.

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



# LightWalker International Recognition

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