

Laser protocol for peri-implantitis treatment

An interview with Dr Michał Nawrocki, Poland

Laser is becoming essential for every modern dental practice. Moreover, from an educational standpoint, there are many benefits in terms of the personal and professional development of the practitioner. In this interview with **implants—international magazine of oral implantology**, Dr Michał Nawrocki explains how laser dentistry has helped to advance his practice and career and why dental laser, especially Fotona's LightWalker, has become an essential part of his daily practice.

Dr Nawrocki, you've been using laser since 2016. Looking back at your journey as a laser dentist, how has LightWalker impacted your everyday practice?

I started my great adventure with Fotona's LightWalker in 2016. Before that I had used a diode laser, but it was insufficient for me, and to be honest my knowledge of lasers, physics, indications and procedures was incomplete at the time. Then in January 2016, I invited Dr Ilay Maden to my clinic to conduct a course and teach my colleagues and me about various Er:YAG and Nd:YAG procedures with the LightWalker laser. A few months later, I decided to extend my knowledge about lasers by attending the Master of Science in Lasers in Dentistry presented by Prof. Norbert Gutknecht in Aachen. Now, I cannot imagine continuing my daily practice and treatments without having LightWalker. Sometimes, I use it as an additional tool during certain procedures, but very often it's a crucial and necessary tool for me to use to conduct a particular procedure.



Use of the Er:YAG laser Varian tip for granulation tissue removal, implant surface decontamination and surface ablation of infected bone.

What procedures do you perform with laser?

Laser can be used in all fields of dentistry; however, I am mainly focused on implantology and surgery, as well as prosthodontics. In prosthodontics, it can be used for sulcus conditioning, preparation for veneers and removal of complete ceramic crowns, as well as during more challenging procedures like crown lengthening before tooth preparation. We can use it in gingivectomy (Nd:YAG laser) and bone recontouring (Er:YAG laser).

All my surgery cases are finished with photo-biomodulation using the Nd:YAG Genova handpiece. I have observed that wound healing is much faster and better in such cases owing to pain reduction, disinfection, reduction of oedema and the laser's analgesic function. Sometimes, I have to conduct an endodontic treatment during the procedure (which is quite rare and normally done by my colleagues), in which case I really appreciate the deep disinfection with Nd:YAG, which offers the highest bacterial reduction in comparison with other wavelengths, and the Er:YAG SWEEPS [shock wave enhanced emission photoacoustic streaming] procedure, which provides the most effective cleaning and disinfection. With surgical treatments, I use both wavelengths in almost all cases. Even when performing an easy and fast tooth extraction, I can use Er:YAG for granulation tissue removal, followed by Nd:YAG for disinfection, clot stabilisation and finally photo-biomodulation. Of course, I use laser before implant insertion, as well as when complications appear.

In your opinion, what are the main benefits of choosing a laser system that includes two complementary wavelengths, such as Er:YAG and Nd:YAG, especially in the field of oral surgery?

Very often, we combine these two wavelengths to conduct treatment in a fast, safe and predictable way. For me, it's crucial to use these two complementary wavelengths—the interaction between the tissue and laser beam is quite different, and owing to these differences in absorption, transmission and scattering, we obtain different actions. For example, during root apicectomy, after flap elevation, I remove granulation soft tissue with the Er:YAG laser using the H14 handpiece with a cylindrical tip (or when I want to be more precise—a Varian tip) and the apicectomy is done with the H02 non-contact handpiece. As the next step, I conduct deep disinfection with the Nd:YAG laser (trans-

mission in hydroxyapatite and absorption in pigmented bacteria) before bone augmentation. Finally, I finish the treatment with photo-biomodulation using the Nd:YAG laser. As you can see from this example, I need both of these two complementary wavelengths to achieve final success with fast healing and proper bone regeneration.

One of your main fields of specialisation is implantology. Where does the laser fit in this field?

We can use LightWalker for all implantology cases. Sometimes, it's only needed for better and faster wound healing (photo-biomodulation with the Nd:YAG laser), but very often it is necessary to conduct the treatment. For me, it's the most important device during immediate implantation with immediate loading, especially when the bone must be very precisely cleaned of granulation soft tissue and disinfected. In the meantime, we can also provoke bleeding of the bone using the Er:YAG laser for superficial bone ablation. I also really appreciate the use of laser during bone grafting with the Khoury method. Sometimes, I combine this technique with immediate implantation, especially in the aesthetic zone. Then, after bone shield fixation, I can use the laser for bone recontouring. With the Er:YAG laser, it's done very precisely—I remove sharp edges and create an emergence profile for the crown—and most importantly, everything is safe for the shield (almost no vibration, so we don't lose stability) and the implant (no thermal effect).

Of course, we can also use the Er:YAG laser for more common and "easy" procedures—like implant uncovering (Er:YAG). The healing is faster and we avoid suturing, but of course, even with the thin chisel tip, some amount of soft tissue is vapourised—so it cannot be conducted in all cases.

In 2018, you defended your master's thesis at RWTH Aachen University titled *Comparison of Two Methods of Peri-implantitis Treatment with the Use of Nd:YAG and Er:YAG Laser*. Can you tell us more about that research?

Owing to the increasing number of implants being placed, the development of peri-implantitis is a growing concern and one of the primary challenges in present-day dentistry. In cases of inflammation, it is necessary to implement treatment, or risk implant loss. However, until now, no uniform protocol or procedure has been defined which could be considered the best and the most effective solution. Different methods of treatment of tissue inflammation around the implant are used, depending on the extent of inflammation, method availability, type of defect, and skills and experience of the dental surgeon.

We know that laser can be used for the treatment of inflammation in soft and hard tissue around implants, such as mucositis and peri-implantitis. I wanted to investigate what kind of procedure would be the most effective and minimally invasive—so the question was whether we could use a minimally invasive, flapless procedure for proper treatment and solve the problem of inflammation.

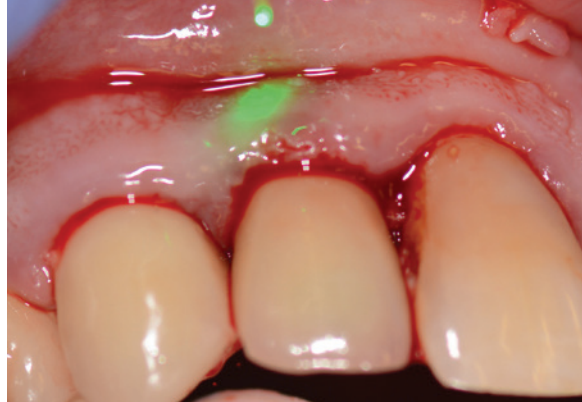


Photo-biomodulation with the Nd:YAG laser.

The procedures were conducted with Er:YAG and Nd:YAG lasers. In the first group of patients, a mucoperiosteal flap was elevated in order to gain better access to the operative area, while the second group of patients was treated using a more minimally invasive procedure without the flap method. The assessment of treatment effectiveness involved clinical and radiographic examination before the surgical procedures and three months after the laser procedures. After conducting the intra-oral examination and defining plaque, probing depth and bleeding on probing indices, photographic documentation of a given area was performed, bitewing and occlusal surface radiographs were taken, and professional scaling and root planing were subsequently carried out.

Based on my research, we know that non-surgical treatment of peri-implantitis is effective and very often reduces inflammation. Of course, when we have severe defects, it's impossible to avoid a surgical procedure to elevate a flap to get proper access to the defect. In such cases too, we should use a non-surgical procedure as a first step to decrease the inflammation and, after two to three weeks, perform the flap procedure. („...“)

Unexpected ending?



Read the complete interview **online**



about the author



Dr Michał Nawrocki is an experienced implantologist. In 2009, he obtained a dental implantology certificate from Goethe University in Frankfurt am Main in Germany. In 2015 and 2016, he participated in the Implant Prosthodontics Program at the Mediterranean Prosthodontic Institute in Castellon in Spain. Dr Nawrocki also obtained an implantology certificate from the University of North Carolina at Chapel Hill in the US in 2016 and earned an MSc in lasers in dentistry from RWTH Aachen University in Germany in 2018. He is a member of the Polska Akademia Stomatologii Estetycznej (Polish academy of aesthetic dentistry), Polish Society for Laser Dentistry and International Society for Laser Dentistry. Dr Nawrocki runs a private practice in Gdańsk in Poland.

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