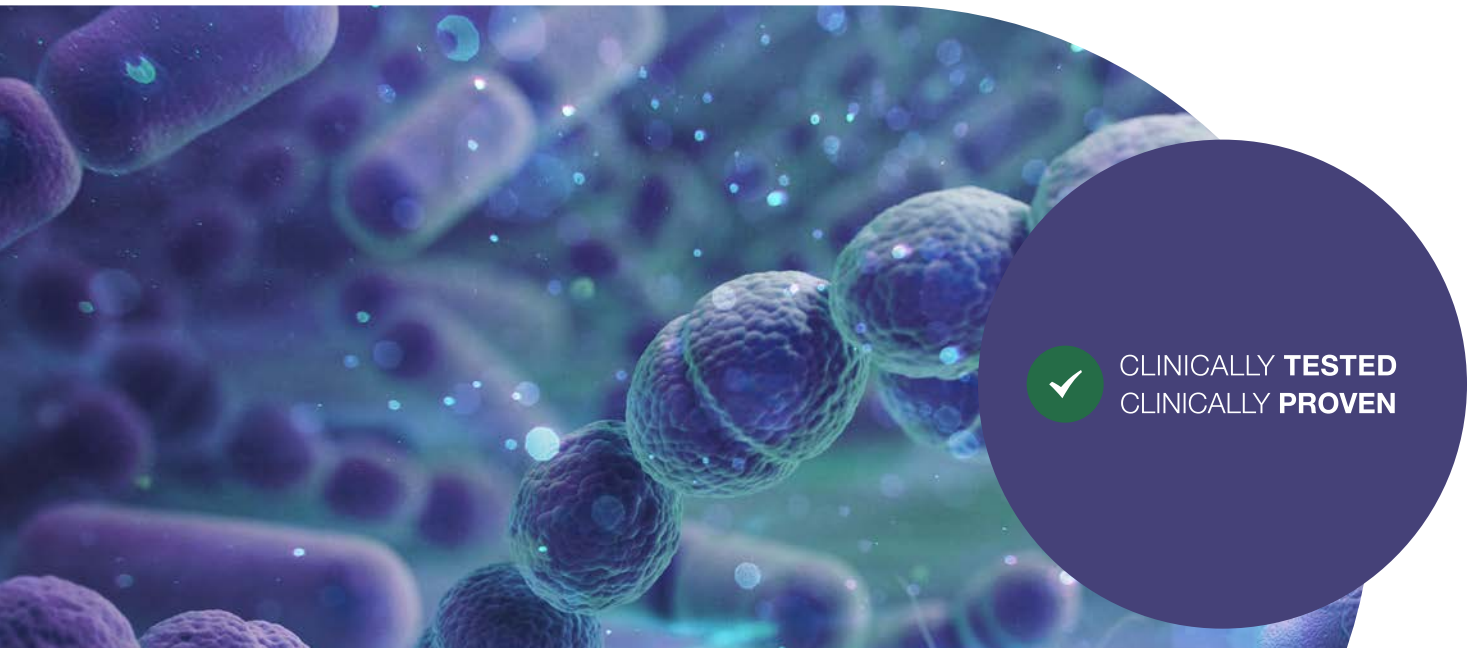


# Lumoral.

## ADVANCED PERIODONTAL TREATMENT



*"Today, I once again saw the benefits of using Lumoral® in one of the implant patients I treated. He had been using the device daily for two weeks. His mouth was completely clean and healthy."*

**–Pekka Kallio, dental specialist, periodontist**

# Lumoral.



Lumoral® is a patented solution for the treatment and prevention of oral diseases. Its effect has been clinically proven, and it improves the control of supragingival biofilm by the patient.

**Lumoral®-treatment is intended to supplement regular mechanical oral hygiene. It is a light-activated antibacterial treatment developed in Finland that helps prevent and treat oral diseases caused by biofilm, such as gum disease, caries, and oral mucositis. The main mechanism of action of the treatment is photobiomodulation, which is supported by an antibacterial effect. The antibacterial effect includes antibacterial blue light as well as photothermal and photodynamic effects.**



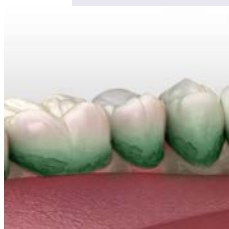
*Our collaboration with Koite Health Ltd, which offers Lumoral® antibacterial treatment, supports our goal. We recommend regular use of the Lumoral® method in addition to traditional home care, as light-activated antibacterial treatment enhances oral self-care and helps ensure that the achieved treatment results are maintained.*

**– Satu Aalto, dentist**

## Benefits for professionals

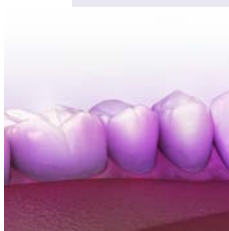
- **Lumoral® supports overall health by improving patient self-care**
- **Improves patient satisfaction**
- **Strengthens patient relationships and commitment to treatment**
- **Customers who receive comprehensive service and care are more likely to return**

# Easy 3-step routine



## Swish

Swish Lumorinse® mouth rinse in your mouth for 60 seconds and spit it out. The light-sensitive dye indocyanine green binds to the biofilm. The binding of the light sensitizer is not necessarily visible to the eye.



## Activate

The mouthpiece is kept in the mouth for 10 minutes. The light activates the dye attached to the biofilm and the antibacterial effect begins. A feeling of warmth and increased saliva production are part of the treatment. The mouthpiece does not need to fit perfectly and does not need to be bitten down on. The light switches off automatically.



## Brush

The interdental spaces are cleaned and the teeth are brushed thoroughly after treatment. The treatment has weakened the structure of the biofilm, which makes cleaning more effective. The mouthpiece is cleaned with liquid dishwashing detergent and running water.



# Lumoral® innovation

According to EFP treatment recommendations, professional and home supragingival biofilm control is highly recommended for all periodontitis patients. However, the EFP does not recommend traditional photodynamic therapy (aPDT). The lack of suitable light sources has slowed its widespread adoption, and in dentistry it has mainly been used in clinics utilizing laser light. Studies show that treatment should be given regularly to achieve a lasting effect, but the method has been limited to expensive, one-off treatments.

**Lumoral® offers a solution to this need. Using the latest LED technology, Lumoral® brings this scientifically proven method to home use for the first time. This opens up the possibility of utilising its full potential in a new way: safely, regularly and cost-effectively.**



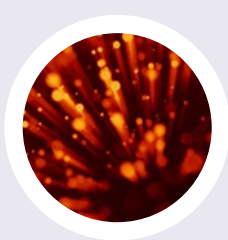
Feature	Traditional aPDT (in-clinic)	Lumoral (home treatment)
<b>Operating principle</b>	The dye is injected into the gum pocket and activated with a laser.	The dye is sprayed on, and the light is administered with an LED mouthpiece.
<b>Operating environment</b>	Only available at dental clinics	Easy to use at home
<b>Target area</b>	Gum pockets, inflamed tissue	Biofilm, inflamed tissue
<b>Frequency of use</b>	1–3 treatments per year	Daily or weekly
<b>Price</b>	High cost, requires special equipment	Affordable for long-term use
<b>Duration of effect</b>	One-time treatment	Continuous and preventive effect
<b>Limitations</b>	Use limited to clinics, high cost	Requires regular use
<b>Effect</b>	Immediate effect, limited long-term effect	Continuous effect reduces biofilm and promotes gum healing



**Lumoral® also contains blue light (405 nm)**, which increases its antibacterial effect compared to clinical aPDT treatment alone. Thanks to the blue light, Lumoral is safe for regular use and does not cause antibiotic resistance.

# The principle of Lumoral® treatment

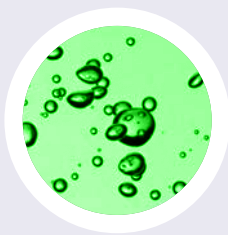
Lumoral® combines four technological effects into one effective treatment.



**Photobiomodulation (PBM) 810 nm**  
810 nm light stimulates the mitochondria in gum tissue cells, increasing their ATP production. It reduces inflammation and promotes tissue healing. Used clinically in the treatment of oral mucosal inflammation, among other things.



**Photothermal effect (aPTT)**  
Indocyanine green binds to bacterial biofilm and is activated by light at 810 nm. The light is converted into heat, which breaks down the biofilm and bacterial cell membranes. The heat also stimulates saliva secretion.



**Photodynamic effect (aPDT)**  
Under the influence of light, the same dye also produces a small amount of reactive oxygen, which supports the photothermal effect. The antibacterial effect is also effective in biofilm.



**Antibacterial blue light (aBL) 405 nm**  
Blue light activates the bacteria's own dyes, improving the effectiveness of aPTT and aPDT treatments. Because the effect is based on the bacteria's natural structures, they cannot develop resistance to Lumoral treatment.



# Proven efficacy

- ✓ Effective treatment for periodontitis and peri-implantitis
- ✓ Can be used regularly without bacterial resistance
- ✓ Non-invasive and well tolerated
- ✓ Reduces plaque and tartar formation
- ✓ Reduces inflammation
- ✓ Reduces gum pockets
- ✓ Promotes long-term oral health
- ✓ Easy to use, even for the elderly and young people

Europe's largest periodontitis study, HOPE-CP, shows that treatment results improve significantly when daily Lumoral® treatment is added to the home care routine for periodontal disease.

**2,2X** more patients achieved healthy gums compared to the control group

**50%** better biofilm removal

**500%** higher treatment response in non-responder patients

**200%** faster inflammation control and improvement of gum pockets



**750+**

STUDY PARTICIPANTS

**23**

UNIVERSITIES AND  
CLINICS INVOLVED

**8+**

YEARS OF RESEARCH



Clinical trials investigating Lumoral® treatment are designed and conducted in accordance with international standards, including ISO 14155 - GCP (Clinical investigations of medical devices – good clinical practice) and the EU Medical Devices Regulation EU 2017/745 (MDR). When clinical studies are conducted with high quality and based on scientific evaluation, both users and oral health care professionals can trust the quality and performance of the medical device.

# Lumoral<sup>®</sup> efficacy in studies

## 1. Bleeding on Probing Index (BOP%)

Result: BOP% decreased significantly in the Lumoral<sup>®</sup> group in several studies.<sup>2 4 9</sup>

- p-values: 0.031, 0.00142, 0.00013, 0.00014, <0.0001 (non-smokers).

## 2. Plaque Indices

Visible Plaque Index (VPI%): decreased significantly in several studies.<sup>2 4 9 10 12</sup>

- p-values: 0.031, 0.00452, 0.044, 0.00395, 0.019

Rustogi Modified Plaque Index (RMPI): significant reduction.<sup>10</sup>

- p-value: 0.0026

Greene-Vermilion Plaque Index (GVPI): significant reduction.<sup>6</sup>

- p-value: <0.000110

## 3. Deep Pockets

Probing Pocket Depth (PPD): significant reduction in three studies.<sup>2 4 9</sup>

- p-values: 0.04982, 0.00434, 0.019

Periodontal Epithelial Surface Area (PESA): significant reduction in two studies.<sup>2 4</sup>

- p-values: 0.0342, 0.0094

## 4. Inflamed Pocket Surface Area (PISA)

Significant reduction in two studies (final report in peer review).<sup>4 9</sup>

- p-values: 0.00162, 0.0344

## 5. Clinical Periodontal Health Index (CPI)

Significant change observed in CPI measurements.<sup>9</sup>

- p-value: 0.00065

## 6. Enzymatic Analysis Measuring Inflammation (aMMP-8)

Significant change in two studies.<sup>1 2</sup>

- p-values: 0.00471, 0.02683

## 7. Other Results

- Dry mouth decreased both subjectively and in objective measurements.<sup>5</sup>
- Use of the Lumoral<sup>®</sup> device improves oral hygiene (subjective and objective evaluation).<sup>1 2 7 8 10</sup>
- Use is experienced as easy and simple.<sup>7</sup>
- Long-term use (over one year) has reduced caries, plaque, and calculus formation.<sup>7</sup>

1. Lähteenmäki H, Pättilä T, Räisänen IT, Kankuri E, Tervahartiala T, Sorsa T. (2022). Repeated Home-Applied Dual-Light Antibacterial Photodynamic Therapy Can Reduce Plaque Burden, Inflammation, and aMMP-8 in Peri-Implant Disease—A Pilot Study. <https://pmc.ncbi.nlm.nih.gov/articles/PMC8947626/>
2. Pakarinen S, Saarela R, Välimaa H-M, Heikkinen AM, Kankuri E, Noponen M, Alapulli H, Tervahartiala T, Räisänen IT, Sorsa T, Pättilä T. (2022). A Randomized Trial of Home-Applied Dual-Light Photodynamic Therapy in Stable Chronic Periodontitis (HOPE-CP) – Interim Analysis of Half Cohort Results. <https://pmc.ncbi.nlm.nih.gov/articles/PMC9689653/>
3. Lähteenmäki H, Pättilä T, Räisänen IT, Kalliala R, Sorsa T. (2025). Peri-Implant Diseases: Enhanced Antibacterial Photodynamic Therapy. <https://onlinelibrary.wiley.com/doi/10.1002/cre2.70146>
4. Tegelberg P, Ojala M, Ylipalosaari M, Lindroth J, Heikkinen AM, Lähteenmäki H, Pakarinen S, Räisänen IT, Sorsa T, Pättilä T. (2025). A Multicenter, Controlled, Randomized Trial of Home-Applied Dual-Light Photodynamic Therapy in Chronic Periodontitis. Preprint: <https://www.medrxiv.org/content/10.1101/2025.03.25.25324596v1>
5. Romppanen W, Helenius-Hietala J, Korte S, Pakarinen S, Saarela R, Heikkinen AM, Sorsa T, Pättilä T. (2025). Dual-Light Antibacterial Photodynamic Therapy: Oral Health Improvements in Assisted Living Facilities Study Design (Article in Press)
6. Cavalcante-Bitu C, Halen P, Lehti S, Pakarinen S, Pättilä T. (2025). Regularly Home-applied Dual-light Photodynamic Therapy on Dental Hygiene- a Prospective Randomized Study in Healthy Adults. (Full study article manuscript TBD, Thesis available in Finnish: <https://www.theseus.fi/handle/10024/799188>)
7. Niva E, Kulmala H, Vakkuri S, Keinänen A-L, Korteniemi A. (2024). Thesis. Comfort of using the Lumoral device and feeling of oral cleanliness in healthy adults. <https://www.theseus.fi/handle/10024/870703>
8. Haukka H, Kinnunen S, Pakarinen S. (2024). Thesis. The benefits of the Lumoral Treatment -device for oral self-care habits. <https://urn.fi/URN:NBN:fi:amk-2024112630435>
9. Sundberg E, Kymäläinen M, Eerikainen H, Pättilä T, Sivén M. (2024) Thesis. The effect of home-use antibacterial photodynamic treatment on clinical oral parameters of patients with grade II or higher periodontitis – Evaluating an innovative medical device. <https://helda.helsinki.fi/items/e9f93e98-1387-4c33-ba12-54f73526b6ae>
10. Gusseva L, Lil L, Runnel R, Pättilä T. (2025) Thesis. Regular Home-Use of Dual-Light Photodynamic Therapy in Oral Plaque Control in Healthy Adults-A Randomized Cross-Over Study. [https://cdn.shopify.com/s/files/1/0264/6291/2621/files/Tarto\\_hygiene\\_study\\_thesis\\_En\\_22May2025.pdf?v=1748262952](https://cdn.shopify.com/s/files/1/0264/6291/2621/files/Tarto_hygiene_study_thesis_En_22May2025.pdf?v=1748262952)
11. Nikinmaa S, Alapulli H, Auvinen P, Vaara M, Rantala J, et al. (2020) Dual-light photodynamic therapy administered daily provides a sustained antibacterial effect on biofilm and prevents *Streptococcus mutans* adaptation. PLOS ONE 15(5): e0232775. <https://doi.org/10.1371/journal.pone.0232775>
12. Nikinmaa S, Moilanen N, Sorsa T, Rantala J, Alapulli H, Kotiranta A, Auvinen P, Kankuri E, Meurman JH, Pättilä T. Indocyanine Green-Assisted and LED-Light-Activated Antibacterial Photodynamic Therapy Reduces Dental Plaque. Dentistry Journal. 2021; 9(5):52. <https://doi.org/10.3390/dj9050052>



# Lumoral<sup>®</sup> clinical pathway

1

Assess the patient's oral self-care status and needs.

**Check for:** biofilm, gingivitis, BoP, deepened gum and implant pockets, individual risk factors such as high risk of bacteremia or low immune response, and self-care habits.

Implement as part of the individual treatment plan

**Preventive/maintenance treatment:** Biofilm control and oral health maintenance

**Therapeutic:** Inflammation control and disease progression

**Intensive care:** Intensive treatment of acute inflammation

2

Method of use*	Frequency	Control	Intended use
Preventive/maintenance treatment <sup>6, 5, 7, 8, 10, 11, 12</sup>	2x week	appx. 1 year	Gingivitis, increased risk of caries, halitosis, improving oral hygiene, stable periodontitis without risk factors
Therapeutic <sup>2, 4</sup>	1x daily	appx. 3 months	Stage I-III periodontitis, peri-implant mucositis, moderate gingivitis
Intensive care <sup>1,3</sup>	2x daily	appx. 1 month	Severe periodontitis stages III-IV or very high levels of gum inflammation
Lumoral use should be adjusted according to the patients' treatment.			

3

Lumoral<sup>®</sup> as part of the patient's everyday life

- **The device is handed over at reception or delivered directly to your home.**
- **Quick to use: approx. 15 minutes per treatment session.**
- **A natural part of your evening or morning routine.**
- **No special skills required.**
- **Suitable for all ages – can be used independently or with assistance.**

\*References to scientific evidence can be found in their entirety on the previous page.



# Recommended by professionals

# 90%

Of the professionals who have tried the treatment, recommend Lumoral® as part of self-care.

# 83%

reports on the benefits associated with biofilm and periodontium.

(periodontal disease, clean mouth feeling, biofilm quantity and composition, excessive tartar formation)

*Lumoral® survey for oral health professionals, 2022–2025.  
Respondents: 660. Internal data from Koite Health Ltd.*



**“The clinical evidence is truly compelling. In particular, personalized risk profile-based guidance from a dental hygienist offers enormous potential for targeted treatment free of side effects. Lumoral will significantly improve the treatment of periodontal disease in particular, with long-lasting effects.**

–Prof. Dr. med. dent. Werner Birglechner, dentist



**“We work with dental implants and complex dental care, and we have been using Lumoral® for quite some time to reduce oral inflammation and improve the results of our treatments. Our patients notice a clear difference after just a few weeks of use. That is why we recommend Lumoral® to our patients.”**

–Akke Kumlien, dentist, Södertandläkarna, Stockholm



**“I am absolutely speechless! It is amazing to see the results in a real patient’s mouth. The patient’s gums are like new, and gum bleeding has decreased from 25% to 2% in a 3-month check-up. All 4 mm pockets have disappeared.”**

–Aliisa Heinonen, dental hygienist

# For the patient's benefit

If you could recommend something to your patient that would really help, why wouldn't you do it?

*I have type II diabetes, which has also led to periodontal disease. I have been fighting these conditions for years with careful self-care and an electric toothbrush and interdental brushes recommended by my dentist, but without achieving satisfactory results. Then I discovered Lumoral, and that's when my mouth really started to heal. I use it regularly every morning and evening as part of my thorough self-care routine. My dentist and dental hygienist have marveled at the tremendous improvement, and of course I notice it myself: the inflammation is under control, my gum pockets have shrunk, and there is no plaque at all. I can warmly recommend Lumoral.*

– Kaisa M., Lumoral® user

*My dentist recommended this device because my mucous membranes and gums were so sensitive that even removing tartar was out of the question. After just ten uses, my dentist noticed a significant improvement in my mouth's mucous membranes and gums. I am grateful for this innovation.*

– Eeva-Liisa K., Lumoral® user

*I had been considering purchasing the device for a long time, but was initially skeptical about its benefits. However, my dentist recommended it and told me more about the product's development history. The conversation reinforced my opinion, and I decided to order the device. Now I can say that it was money well spent, even though it was an expensive purchase. My only regret is that I didn't buy it sooner, as my mouth would be much healthier now.*

– Kaisa S., Lumoral® user

*I started using the device about two years ago on the recommendation of my dentist for dry mouth problems. The device has helped and kept my gums in better condition. Now we are getting our own device for my husband as well.*

– Pirjo D., Lumoral® user

★★★★★  
850+ REVIEWS

40 000+  
SATISFIED USERS

2M. ANTIBACTERIAL  
TREATMENTS PERFORMED



# Understøt dine behandlinger med Lumoral®

- bestil Lumoral **klinikpakke** indeholdende introduktionsmøde, produkter og informationsmaterialer.
- anbefal Lumoral til dine patienter og send dem til **[www.lumoral.dk](http://www.lumoral.dk)**, hvor de kan købe en behandlingspakke.
- Scan QR koden og se behandlingspakkerne på **[www.lumoral.dk](http://www.lumoral.dk)**



# In research collaboration

## Finland

University of Helsinki  
Metropolia University of Applied Sciences, Helsinki  
Tampere University  
Pirkanmaa Wellbeing Services County  
Mehiläinen Healthcare Services Ltd, Tampere and Kemi  
Lahanna Dental Care Ltd, Tampere  
University of Oulu  
Oulu University of Applied Sciences  
Hammas Hohde Ltd, Oulu  
Sirius Dental Clinic Ltd, Oulu  
Turku University of Applied Sciences  
Savonia University of Applied Sciences, Kuopio

## Sweden

Karolinska Institutet, Stockholm  
Borgska Villan Specialist Dental Care, Lund

## Estonia

University of Tartu  
Medshop24, Tallinn

## Germany

Medical School 11, Hamburg

## Lithuania

Lithuanian University of Health Sciences, Kaunas  
Hospital of Lithuanian University of Health  
Sciences Kaunas Clinics

## Greece

Aristotle University of Thessaloniki

## Italy

Sapieza University, Rome  
Torino University



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## Book et møde

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