VDC VISHNU DENTAL COLLEGE

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VISHNU UNIVERSAL LEARNING

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LASER stands for "Light Amplification by Stimulated Emission of Radiation." Laser assisted dentistry being minimally invasive is an evolving branch and more opted due to its precision, faster healing, patient friendly, less pain & faster return to routine work. This technique offers an alternative to traditional dental tools like drills and scalpels.

Laser clinic at Vishnu dental college is equipped with Diagnostic Laser devices like VELSCOPE and DIAGNODENT, Diode lasers of various wavelengths (470nm, 650nm, 810nm, 980nm) and Advanced all tissue laser (FOTONA LightWalker AT S with Nd:YAG- 1064nm, Er:YAG- 2940nm) designed for ultimate versatility, with the most comprehensive lists of clinical applications in all laser-assisted treatments. With the choice of different complementary wavelengths available, which facilitate newer combo coherence treatment provisions for research & quality dental care for patient.

VELSCOPE is a novel, cutting - edge optical method designed to identify precancerous lesions and cancer at an early stage. It uses a handheld scope to illuminate oral tissue with blue light and visualizes the resulting natural tissue fluorescence. This fluorescence enhances the traditional oral examination allowing visualization of abnormal areas that may not have been apparent or even visible to the naked eye.

DIAGNOdent pen along with clinical evaluation enhance early detection of fissure and proximal caries. It uses 655nm wavelength on dental surface which is absorbed by metabolites of intraoral bacteria which emit a red fluorescence. The perio-probe of the DIAGNOdent pen, detects calculus more thoroughly than conventional probes.

Diode Laser Systems (Pioon P1 Blue and Denlase) are soft tissue lasers with wavelength of 470nm, 650nm, 810 nm and 980 nm, designed for a wide variety of oral soft tissue procedures- Gingivoplasty, Root canal disinfection, Implant uncovering, a-PDT, Laser teeth whitening and Photobiomodulation. These dental laser units come with varied accessories – Disposable tips, Biostimulation Applicator, TMJ Applicator and Whitening Applicator.

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Advanced Laser system: FOTONA LightWalker® AT S

The LightWalker® model AT S comes with dentistry's two most effective laser wavelengths: Er:YAG and Nd:YAG. 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 making it as an "universal" laser.

Key Features:

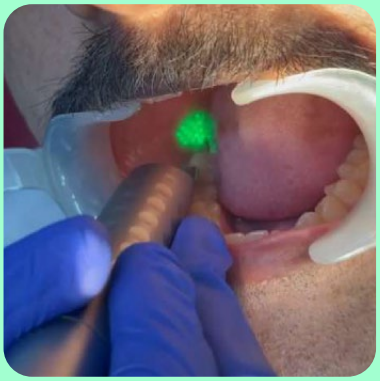
1. Dual-Wavelength Technology: Fotona laser systems typically combine both Er:YAG and Nd:YAG lasers. TwinLight® perio and Peri-implantitis treatment combines dentistry's two best laser wavelengths.

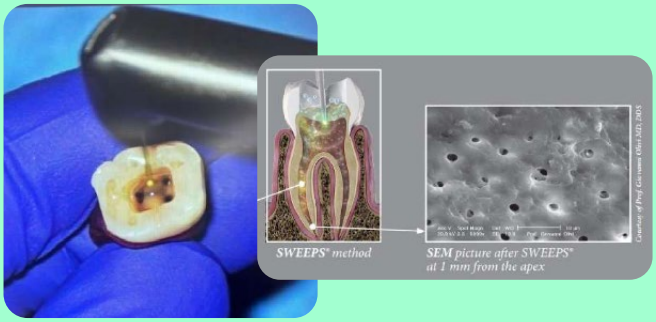
2. Smooth Mode: Fotona's proprietary Smooth Mode is a unique technology used for snoring treatment. Snoring treatment: A non-invasive treatment using Er:YAG Laser in an nonablative mode due to remodeling & new collagen formation leading to shortening of the mucosa & increase in Oropharynx space thereby increasing the volume of air flow passage.

3. SWEEPS: Shock Wave Enhanced Emission Photoacoustic Streaming uses patented technology to deliver an optimal sequence of shock waves into the cleaning fluids, reaching deep into lateral canals and microscopic tubules to deeply disinfect dentinal walls by removing tissue, debris, biofilm and bacteria.

4. Photobiomodulation handpiece (MarcCo M) provides unique collimated Top-Hat profile homogeneous Nd:YAG beam with 24 mm spot size.

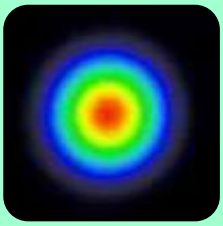
5. Aesthetic treatments: Fotona's LightWalker® AT-S laser system also enables many popular facial aesthetic treatments which can draw a completely new clientele to the practice. The Er:YAG laser is effective for resurfacing and skin treatments, while the Nd:YAG laser is ideal for deeper tissue treatments, such as hair removal and vascular concerns.



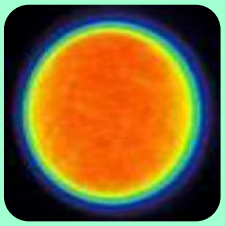


Laser physics:

Gaussian Beam effect is the characteristic feature of Diode laser wherein the energy is more at the centre and gradually decreases at the periphery. Top Hat Profile: It is a patent of Fotona where in the energy is distributed uniformly from centre to periphery, thus producing effective and precise treatment outcomes.



Gaussian Beam Effect



Top Hat Profile

APPLICATIONS

Department of **Pedodontics & Preventive Dentistry**

a **Sealant application:**
This Preventive procedure needs fissure cleaning & etching of the retentive pits & fissures which is done using Er:YAG for better bonding and retention/ survivability of sealant.


c **Laser Pulpotomy using Er:YAG & PBM using diode Laser:**
In immature permanent tooth with pulpitis to facilitate apexogenesis laser pulpotomy followed by photobiomodulation is done.


b **Labial Frenectomy:**
In Midline diastema cases frenectomy can be done using a Er:YAG laser with minimal discomfort, pain and faster recovery

Department of **Conservative Dentistry & Endodontics**

a **Cavity Preparation:**
Lasers can be used for removing decayed tooth material and preparing cavities for fillings without the need for traditional drills. This can result in less discomfort, and the laser helps in sterilizing the cavity.

b **Tooth Whitening:**
Some laser systems are used in combination with bleaching agents for professional teeth whitening treatments. The laser accelerates the whitening process by activating the bleaching agents more effectively.

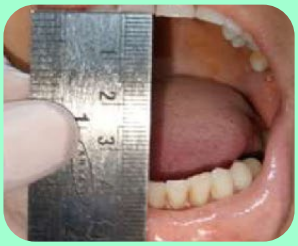
c **Root canal disinfection:**
Biofilms in root canals are the main cause for reinfections but difficult to treat. This can be addressed with both diode (aPDT) & hard tissue lasers(SWEEPS).

Department of **Oral Medicine & Radiology**

a **Leukoplakia:**
Oral leukoplakia is a predominantly white lesion of the oral mucosa and some oral leukoplakias will transform into cancer. Laser ablation offers hemostasis , outstanding field visibility, precision , compared to regular scalpel excision.



b **Temporomandibular disorders** are characterized by the presence of signs & symptoms involving muscles, joint and its associated structures. Lasers can be a boon for addressing these symptomatic problems through Photobiomodulation therapy and improves mandibular function for the definitive management.

Department of **Orthodontics**

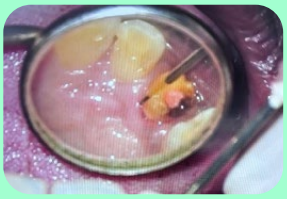
a **Gingival overgrowth:**
During orthodontics treatment gingival overgrowth is observed due to various reasons compromising the esthetics in such cases lasers can be used as an adjunt for gingivectomy.



b During orthodontic treatment, most commonly encountered problem is pain and is associated with the long term treatment this can be overcome by using Photobiomodulation as it accelerates tooth movement and reduces pain.

Department of **Prosthodontics & Implantology**

a **Troughing:**
Post tooth preparation recording of the finish line is a prime factor for success of FPD. For accurate impression making lasers can be used for gingival troughing prior to impression making.

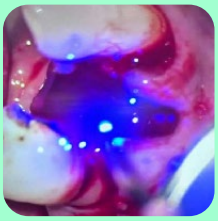


b **Implant exposure and Phototbiomodulation:**
During second stage of implant procedure to maintainence of the emergence profile can be facilitated using minimally invasive tool like laser for precise and better esthetic outcomes.



Department of **Oral & Maxillofacial surgery**

a **Clot stabilization:**
Stabilization of blood clot after tooth extraction using diode fiber tip to cause gelation of the clot earlier to enhance clot retention & prevent dry socket.

b **Lingual nerve paresthesia using PBM:**
Nerve paresthesia is a common complication following mandibular 3rd molar surgery which can be addressed with diode lasers for regaining the neural sensations through Photobiomodulation.

Department of **Periodontics**

Lasers are used for various soft tissue surgeries like crown lengthening, gingivectomy, and reshaping the gum line. This process is more comfortable, as lasers minimize bleeding and promote quicker healing.

1 **Crown lengthening**


2 **Gingivectomy**


3 **Frenectomy:**
A frenectomy involves the removal of the frenulum (the tissue that connects the lip or tongue to the gums. This can be done using a soft tissue laser with minimal discomfort and faster recovery. Photo biomodulation was done after frenectomy procedure to reduce inflammation and pain.


Contributed by TEAM VDC

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