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# DENTAL 360

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**PREVEST DenPro<sup>®</sup>**  
THE FUTURE OF DENTISTRY

DENTAL  
360

A portrait of Dr. Anil Kishen, a man with dark hair, wearing a white dress shirt and a blue patterned tie. He is looking directly at the camera with a slight smile.

**“Pursue your ambition as if your life hangs on it. Unfortunately, there is no achievement without agony”.**

**Dr. Anil Kishen**

## Embracing digital technologies

**T**he Digital technology has transformed every aspect of our lives. In these tough times, digital media has completely transformed education, work places and even the entertainment world. Healthcare is also not too far behind in this race towards futuristic digital technology. This digital transformation offers an opportunity to deliver remote services and improve efficiency of healthcare professionals.

Telehealth offers a wide range of benefits to the healthcare industry during these tough times. Use of technologies, such as computers and mobile devices can enable people to access services remotely and manage oral health care. Online portals to handle oral health programs are becoming increasingly popular. The portals use technologies which can offer video consultations and maintenance of patient records. Virtual appointments through videoconferencing provides a platform for better understanding of the patient's problems and also offers a personal touch to patients. Remote monitoring of patients is also a possibility with digital technologies. Doctors can take advantage of technology to provide better care and may prevent unnecessary in-person appointments, reduce wait times and eliminate unnecessary travel.

A multitude of apps have been created to help Healthcare professionals to better organize their time, plan their virtual appointments and store patient data/information in a single secure place. Technology has the potential to improve the quality of health care and to make it accessible to a larger section of the population. Telehealth may provide opportunities to make health care more efficient, better coordinated and closer to home.

The concept of Telehealth is still relatively new and has the potential to transform oral health care. However, it can also splinter the health care system and raise the risks involved in the inappropriate use of medications.



**Dr. Sai Kalyan**

# Profile of the Month



## **Dr. Anil Kishen BDS, MDS, PhD**

*Professor, Endodontics Program*

*Graduate Coordinator, Graduate Education*

*Principal Investigator, Dental Research Institute*

*Faculty of Dentistry, University of Toronto, Toronto, ON, Canada*

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*Visiting Professor of Endodontics, King Juan Carlos University, Madrid, Spain*

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*Dr. Kishen* received his clinical specialty training in Endodontics & Conservative Dentistry from the Madras Dental College, India. His PhD is in the field of Biomedical Engineering from the Nanyang Technological University in Singapore. After his stint as Assistant/Associate Professor at the National University of Singapore, he moved to the University of Toronto, where he is currently a Full-Professor in Endodontics, Graduate Coordinator, Graduate Education, and a Principal Investigator at the Dental Research Institute, University of Toronto. Prior to the Faculty restructuring Dr. Kishen was the Head of Discipline of Endodontics at the University of Toronto from 2012 to 2016. He currently serves as an Associate Editor for the *Journal of Endodontics*, *BMC Microbiology*, *Clinical Oral Investigations* and *Frontiers in Dental Medicine*, besides serving as an Editorial Board Member for several international journals.

*Dr. Kishen* is a recipient of many awards and honors including, The Enterprise Challenge Innovator Award in Singapore (2002), University of Toronto Dental Student Society (DSS) Honorary Member Award (2013) for his contribution to undergraduate education, Honorary Diplomat of the Indian Board of Endodontics (2013), the American Association of Endodontists (AAE) Foundation-

*Denstply-Research Excellence Award (2013) and the Journal of Endodontics Publication Awards (2015, 2016, 2020), W. W. Wood Award (2016) from Canadian Faculty Association for excellence in dental education and the prestigious Louis I Grossman Award (2020) from the AAE, which recognizes an author for cumulative publication of significant research studies that have made an extraordinary contribution to endodontology.*

*Dr. Kishen* has published over 20 book chapters, and has edited three interdisciplinary textbooks. He has published over 150 peer-reviewed journal publications, and is a co-inventor in several patents / invention disclosures. Dr. Kishen has delivered over 150 invited / plenary lectures worldwide. His research focuses on nanomaterials and phototherapeutics to fight oral health infections and improve patient outcomes. He specifically studies topics in endodontic infections, analyses interactions between host tissue and harmful bacteria besides wound healing. His research is currently funded by the Canadian Foundation of Innovation, Natural Sciences and Engineering Council of Canada (NSERC): Discovery Grants and the American Association of Endodontists Foundation.

# "In-Office Bleaching : Old Concept; Newer Perspective"

S. SAI KALYAN

## ABSTRACT :

Discolored teeth can be managed by various methods like scaling and polishing, microabrasion, bleaching, veneers and crowns, each with its own set of pros and cons. Though not all discolorations are amenable to bleaching, Bleaching appears to be the most conservative way of adequately treating most tooth discolorations. A plethora of Bleaching lights are available in the dental market today and manufacturers claim better and faster results when teeth are bleached in presence of light. However, Role of light in bleaching remains unclear with numerous studies concluding no net increase in speed or efficacy of teeth whitening in presence of light. This paper addresses this controversial issue to assist dental clinicians in enhancing their knowledge about the bleaching process and their understanding of the effects the procedure may have on pulp and existing restorations.

## KEYWORDS :

Bleaching, In-office Bleaching, Light, Laser bleaching, Tooth Whitening.

## INTRODUCTION :

"Sometimes your joy is the source of your smile, but sometimes your smile can be the source of your joy."  
— [Thích Nhất Hạnh](#)

In this modern world, looks can have a major impact on the social life of an individual. It is beyond doubt that looking good directly affects an individual's personal esteem and social acceptance. Since teeth constitute the most noticeable part of the face, it is not amazing to find an increase in awareness for a perfect smile and teeth makeovers in day to day dental Practice.

Discolored teeth can be managed by various methods <sup>1, 2</sup> like scaling and polishing, microabrasion, bleaching, veneers and crowns each with its own set of pros and cons. Though not all discolorations are amenable to bleaching, Bleaching appears to be the most conservative way of adequately treating most tooth discolorations. Numerous approaches for bleaching of non-vital tooth have been described in literature. They could be broadly divided into in-office bleaching, dentist assisted night bleaching and over the counter (OTC) mass market bleaching products. In recent times, in-office bleach has gained enormous popularity owing to its immediate results and strong promotion by manufacturers. The contemporary in-office bleaching systems are based of different concentrations of Hydrogen peroxide and are often used in combination with activating agents such as heat, light or chemicals.

Several Light activation devices have been introduced into the market and were promoted as an adjunct to the bleaching procedure. It began with the conventional curing lights and was soon taken over by LASERS and plasma arc lights. This article provides an overview of various activation modalities for In-office bleaching techniques to assist dental clinicians in enhancing their knowledge about the bleaching process and their understanding of the effects the procedure may have on pulp and existing restorations.

## Active ingredients and activation systems: Does light Add up to the results :

In-office bleaching formulations basically contain 20-30% Hydrogen peroxide. in addition several constituents have been incorporated to improve handling characteristics and enhance the bleaching procedure.

Use of bleaching lights have been popularized by many manufacturers to accelerate bleaching systems. Halogen Curing lights, LED's, Plasma Arc and lasers have been employed to activate the peroxide systems. For any new technology or technique to be incorporated in to practice involving use on humans, it should have scientific documentation backed up with concrete evidence. With the Introduction of various bleaching lights into the dental market, dental clinician is at crossroads whether to involve bleaching lights into their practice or not.

It is indeed a well known concept that rate of chemical reactions increases with an increase in temperature.<sup>3</sup> On these lines, abbot in 1918 was the first to report use of high intensity light to raise the temperature of bleaching agent and hence accelerate the process of bleaching.<sup>4</sup>

Marson<sup>5</sup> and Colleagues evaluated the effectiveness of light activation for in-office bleaching techniques with a 35% hydrogen peroxide gel. No statistically significant differences were observed with respect to color change and color stability over a follow up period of six months, when bleaching was performed with or without the use of light source.

Another study<sup>6</sup> evaluated the effects of LED/ laser activation on bleaching effectiveness and tooth sensitivity during in-office bleaching. It was found that activation with the light source used did not result in superior tooth whitening higher and **persistent tooth sensitivity levels** after 24 hours of bleaching were observed when LED/laser light activation was used. The use of light activation also raised pulpal temperatures in the range of 14- 17°. Such a raise in These temperature are detrimental to the pulp<sup>7</sup>.

To overcome these adverse effects, several manufacturers have introduced systems activated by chemical activators which could be brushed to the teeth (figure:2c). These systems were combined advanced light-cure gingival block-out isolations systems (figure:2b).

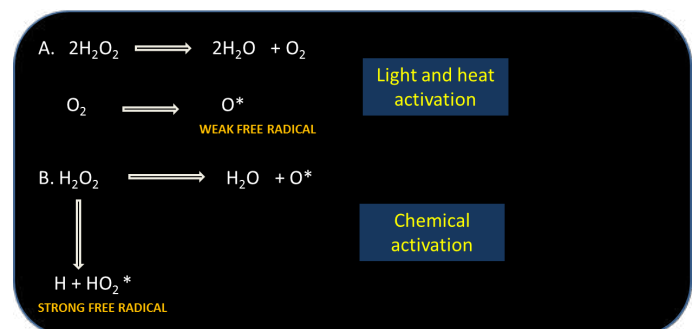


Figure 1: Dissociation Of Hydrogen Peroxide using different activation systems

**CLINICAL SITUATION:**



Fig 2a: initial shade selection D4 (Vita Shade guide)



Fig 2b: Application of Liquid dam (Florence, Prevest Denpro, Jammu). Light cured for 20 seconds



Fig 2c: Application of Bleaching agent, (Florence Kit, Prevest Denpro, Jammu).



Fig 2d: Shade change after 20 minutes of bleaching (D4 to A2, Vita shade)

The chemical activated systems provided enhanced results and decreased hypersensitivity to acceptable levels. These systems also reduced the delirious effects of the peroxide components on dental tissue<sup>8</sup>.

**CONCLUSION :**

In spite of being one of the most commonly practiced dental procedure and the most popular one amongst public, there is a relative paucity of data in the literature concerning the use of light activation for bleaching and how the effects of bleaching can be optimized in a clinical setting. Nevertheless, as with any other cosmetic procedure, Bleaching also has its set of limitations. It is neither permanent nor absolutely risk free. So, it is prudent to work under proven scientific evidence backed up with the sound fundamentals and improved tooth whitening materials and techniques. It should be understood that light activation may speed up the bleaching reaction when a low concentration of hydrogen

peroxide is used<sup>7</sup> but at higher concentrations that are routinely used in in-office bleaching procedures, Light does not appear to play any significant role.<sup>10, 11</sup> Hence, Use of light activation to impress patients or as a marketing strategy must be weighed against the harm that temperature rise resulting from light activation may cause to the pulp. Taking into consideration the increased pulpal temperature, hypensensitivity and enhanced clinical efficacy, chemically activated bleaching agents can be considered to be safest method to achieve a predictable whitening results.

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**Dr. Sai Kalyan**

“Academician, researcher and medical device expert. He has a masters degree and a PhD in endodontics. His current interests include bioactive materials, nanomaterial systems and regulatory affairs.”

**Florence® (In Office Whitening System)**

**Product Profile**

Florence is a chemically activated in office whitening gel containing 35% hydrogen peroxide. The new pH activated technology enables a fresh fast acting mix every time. This unique technology can be used to whiten teeth in a relatively short time. The system employs a novel Blockdam partially adhesive resin isolation technology to isolate the gingiva from the harmful effects of the peroxide ions. The whitening system does not require any light activation, making it the apt technology to be incorporated into every day dental practice.



# Overview of the Implant Planning Workflow

## INTRODUCTION :

The demand for implant treatments is on the rise, and so are patient expectations. Patients are now more informed about the procedure, and demand results that are both highly functional and aesthetic and which can be offered in minimum appointments possible. To render the best possible treatment for patients, clinicians must be meticulous in their assessments and planning to derive upon a treatment plan that suits the patient's requirements as well as one that is practically achievable. An elaborate pre-operative assessment, intraoral and extraoral examination with the necessary documentation and finally communicating the realistic treatment plan with the patient and obtaining the patient approval are the steps involved. Although this may seem very obvious to us, there are a few points we may tend to miss out while carrying out our assessment and planning. This article is an overview of the necessary steps and highlights points that can be useful while planning implant cases.

## PRE-OPERATIVE ASSESSMENT :

◆ Medical/Social history ◆ Intraoral radiographs ◆ Clinical Photographs ◆ Intraoral Scans/Impressions ◆ CBCT scan ◆ Patient concerns and expectations.

## ANALYSIS AND PLANNING :

◆ Prosthetic design ◆ Soft tissue analysis ◆ Hard tissue Analysis ◆ Patient Analysis (risk factors).

## FORMULATION OF TREATMENT PLAN :

◆ Patient discussion ◆ Patient approval

**Figure 1:** Implant Planning Workflow

## PRE-OPERATIVE ASSESSMENT :

One must never underestimate the importance of a thorough medical history which allows screening for various medical conditions, radiation therapy, prolonged use of medications like bisphosphonates, corticosteroids, etc. A social history can reveal certain habits like smoking, stress levels, fitness levels, etc. Creating checklists enables clinicians to go through all these aspects quickly and effortlessly. It is important to address the chief complaint of the patient with thorough understanding of the patient's expectations and concerns. Past dental history will also render valuable information in this regard.

An extraoral examination evaluates general parameters such as facial symmetry, midline, the orientation of occlusal plane, presence of lip support, assessment of smile width and smile line. The necessary extraoral photographs have to be documented. An intraoral examination involves assessment of the overall gingival biotype and mucosal tissue, occlusal assessment which allows assessment for parafunctional habits and bruxism, as well as evaluation of the interocclusal space in the edentulous site. This is usually accomplished after obtaining study models, utilizing mounted casts and diagnostic wax-ups. For planning in the aesthetic areas the Esthetic Risk Assessment (ERA) tool given by ITI can be used to determine the risk of achieving an esthetic result based on known surgical and restorative approaches in a given clinical situations.

This is an excellent communication tool that can be used in all esthetic cases to help both the clinician and the patient achieve their esthetic goals. The more high-risk categories the patient falls into, the more conservative the surgical and restorative approach should be. This will help avoid any potential esthetic disasters later.

Cone Beam Computed Tomography (CBCT) imaging provides valuable insights about the mandible and maxilla but it does not provide enough information about the surface details of the teeth or soft tissues. Nowadays, the CBCT information can be combined with a digital impression on interactive treatment software and can greatly enhance the clinician's diagnostic capabilities and treatment planning. Buser et al. recommend completing an anatomic and surgical risk assessment to ensure that deficiencies in bone and soft tissue and other potential risk are addressed.

## ANALYSIS AND PLANNING

### PROSTHETICALLY DRIVEN PLANNING :

The traditional methodology behind the implant workflow involved placing the implant first in the available bone and then determining where the crown should be positioned. Prosthetic-driven planning, however, reverses this process with a crown-down approach. With this method, the outcome lies at the heart of the workflow, driving the process from start to finish. There are no unwanted surprises at the restorative end of the process. The clinician has a more predictable and often higher quality outcome. Deficiencies in the soft and hard tissues can be analyzed based on the prosthetic position and appropriate hard and soft tissue augmentation procedures can be planned.

### SOFT TISSUE ANALYSIS :

For predictable long-term peri-implant tissue stability, various soft tissue factors such as the biologic width, the papilla height, the mucosal soft-tissue level, gingival phenotype (thick or thin), keratinized tissue and biotype of the mucosa must be considered.

Thickness of soft tissue influences the behavior of the crestal bone during integration of implants. Initial gingival tissue thickness at the crest has a significant influence on marginal bone stability around implants. Tissue thickness of 2.0 mm or less could lead to crestal bone loss of upto 1.45 mm, despite a supracrestal position of the implant-abutment interface. For patients that present with a thin facial tissue or thin gingival tissue phenotypes, use of soft tissue grafts help to enhance gingival contours and thickness. Thicker gingival phenotypes tend to be less prone to recession and are better at withstanding inflammation.

It is well described in the literature, that the utilization of a subepithelial connective tissue grafts simultaneous to immediate implants placement, improves the stability of the peri-implant soft tissue and maintains facial gingival level.

### PAPILLA HEIGHT :

Tarnow et al. found that the mean papillary height between adjacent implants from the bone crest to the top of the papilla amounted to 3.4 mm with a large variability reaching from 1 to 7

mm. This is considerably less than the previously reported value of the normal papilla height of 5 to 6 mm between two adjacent teeth. There is a significant relationship between papilla presence and the distance of the contact point of the implant restoration and the adjacent tooth to the crestal bone.

#### **HARD TISSUE ANALYSIS :**

Hard-tissue deficiencies prior to implant placement could be due to tooth loss, trauma from tooth extraction, periodontitis, endodontic infections, longitudinal root fractures, general trauma, bone height in the posterior maxilla (area of sinus floor) and systemic diseases.

To avoid problems in dental implant positioning in the mesiodistal, facio-lingual or apico-coronal dimensions, adequate bone support is essential prior to dental implant placement. Bone loss and concavities in the bone should be addressed with bone grafts combined with barriers to regenerate bone prior to or during dental implant placement, for sites with thin facial bone, a combination of bone grafts and soft tissue grafts is recommended to help in the formation of a thick tissue phenotype. Ideally  $\geq 2$  mm of buccal bone labial to the healed implant is considered necessary to ensure proper soft-tissue support and to avoid resorption of the buccal bone and gingival recession following restoration.

#### **CONCLUSION :**

The patient must be presented with two or more treatment plan options and the realistic outcomes should be discussed. After finalizing the customized treatment plan, consent must be obtained by the patient. Relevant pre-surgical tests and investigations must be carried out before the treatment appointment. Good planning is a key to successful treatment.

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She has a Diploma in Laser Dentistry from Vienna, Austria.



# PREVEST UPDATE



**Rashtriya Shikshan Mandal Ahmadnagar**  
**N.N Sattha College Of Pharmacy Ahmadnagar**



**PREVEST DenPro®**  
THE FUTURE OF DENTISTRY

## **Prevest DenPro Partners with N.N.Sattha College of Pharmacy.**

*Prevest DenPro limited and N.N. Sattha College of Pharmacy, Ahmednagar. Signed an memorandum of understanding for promoting research with special emphasis on Nano-Biomaterials, Drugs, herbals, Regenerative science and related fields. N.N. Sattha College of Pharmacy is one of the premier pharmacy institutes in Maharashtra with robust infrastructure and a high research output. The institute offers both undergraduate and postgraduate courses and maintains high standards of education and research.*

*This MOU intends to fill the existing gaps in translational research by creating strong bonds between the academia and industry. The research aptitude of N.N. Sattha College of Pharmacy combined with the research strength of Prevest DenPro would open up new horizons in Biomaterial technologies.*