

# Near infrared (NIR) transfacial led therapy Light Modulation<sup>®</sup> (LM) a new adjuvant treatment in postsurgical and chronic periodontal patients



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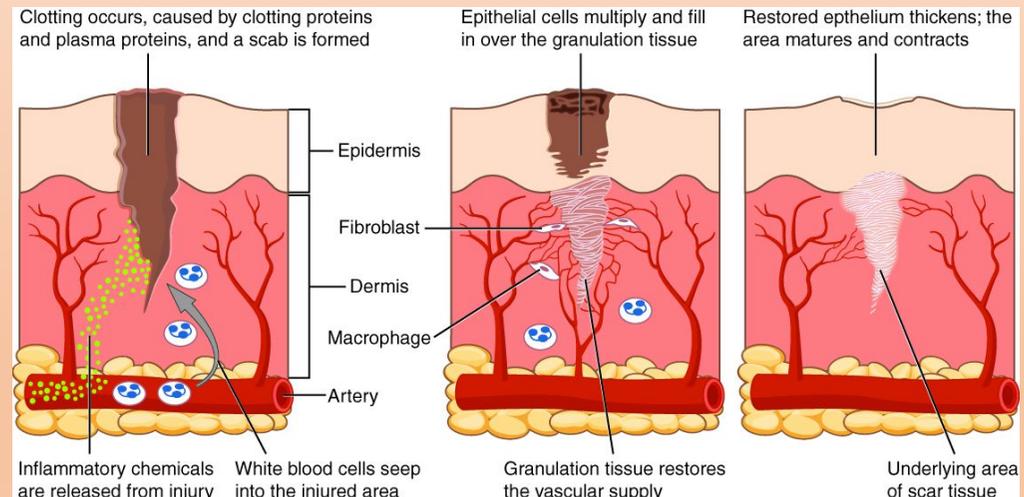
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# Introduction

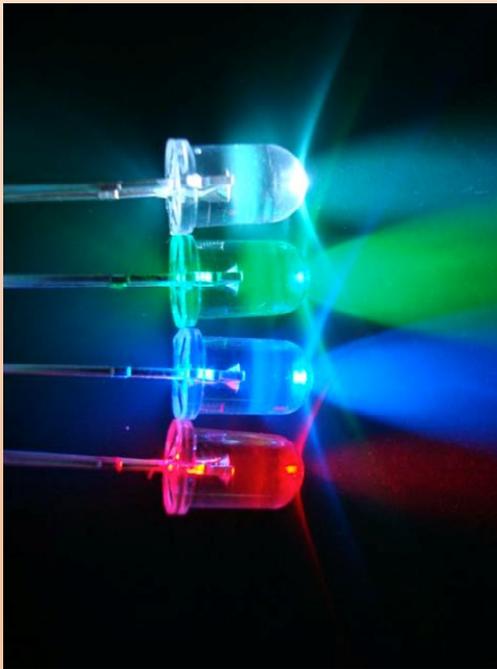
NIR technology is recommended since many years to support cutaneous repair of wound healing, based on the well known rationale that infrared light may stimulate cell activity and promote tissue repair.



*Wound Healing*

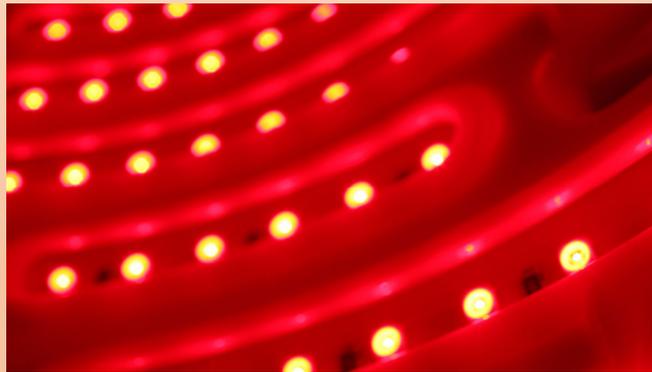
# Introduction

NIR and Red led technology used since many years in Aesthetic Medicine, may also represent a safe and effective method to prevent and cure skin aging.



# Introduction

Red led technology was marketed as a potential aid in treatment of periodontal diseases by reduction of inflammatory cytokines, direct interaction with Porphyromonas Gingivalis or via photosensitization (photodynamic therapy).



# Introduction

Drawbacks with red led are:

- due to short penetration of red led light there is a need for intraoral devices (sterilization)
- as near as possible, almost an in-pocket approach is mandatory
- a tooth by tooth procedure is advisable
- operator dependent, time consuming protocol is needed.



## **Chronic periodontal patients' management can be a demanding problem in the dental office:**

- Adjunctive procedures to periodontal therapy, such as locally delivered or systemic antibiotics have been evaluated.
- Although the adjunctive use of antibiotics may be effective in the elimination of periodontal germs, the frequent use of antibiotics could lead to side effects or to the development of bacterial resistance

## **Chronic periodontal patients' management can be a demanding problem in the dental office:**

- As a matter of fact, SRP alone may fail to eliminate subgingival bacteria located in inaccessible areas to periodontal instruments .
- Surgical dental patients, perio or not, can sometimes complain a difficult post-op downtime, that cannot be always managed with drugs.

- Near infrared led light (NIR) has been suggested as an **adjuvant therapy in the periodontal disease and in post-op oral surgery management**

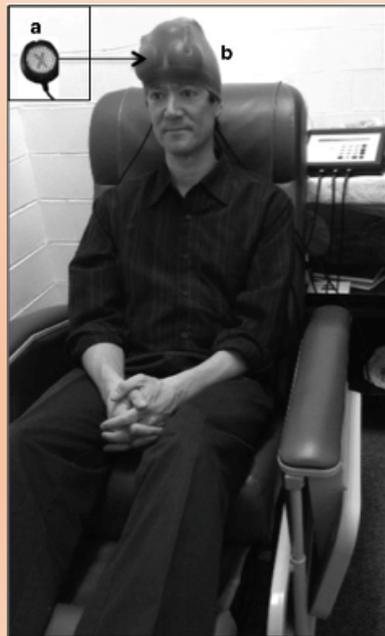


- The rationale behind the use of infrared led devices is the heat generation, the increase in microcirculation and the stimulation of fibroblasts healing responses, namely reparation processes.

- Many of the surgical and non surgical therapeutical procedures in periodontal treatment deal with a mechanical removal of a pathogenetic cause of disease, in other words the bacteria involved.
- **By doing so, a damage occurs in the tissues, that slowly heal spontaneously.**
- The infrared light helps to speed the process by enhancing the healing response stimulating the fibroblasts and microcirculation, in the same way as it does in the skin when it is applied superficially.

# Extraoral sources of infrared led lights are really capable to cross soft and hard cranial structures.

Recently, interesting neurological studies were performed for treating brain injuries. They showed that cognitive functions can be improved by the application of infrared led light with transcranial headsets. Researchers measured a real increase of blood flow in brain lobes.



from Naeser et al, 2014



from Naeser et al, 2011

# Clinical Study

We tested the hypothesis that an extraoral source of infrared led light can be a valid support to our standardized periodontal and surgical therapy.



pre-surgery



post-surgery

# Materials and Methods

## ***ENTRY CRITERIA***

### **1) Perio group:**

- common gingivitis: 10 patients
- chronic periodontitis in maintenance: 10 patients

### **2) surgery group**

- (perio surgery, wisdom tooth surgery, dental surgery, oral surgery): 10 patients



# Materials and Methods

## ***NIR THERAPY***



**Light Modulation<sup>®</sup> (LM) Technology average applications**

**1** session t-0, immediately after causal treatment

+

**1** session per week for 1 month

↓

= **5** treatments

Re-evaluation at week 5, data collection and comparison

# Methods

**Light Modulation® (LM)** \_ Espansione Group, Bologna, Italy

Perio group – chronic periodontitis

## ***Protocol:***

**PSR 0** : prevention light protocol

- 2 Light Modulation® (LM) sessions of 20', each 10 days

**PSR 1**: prevention medium protocol

- 3 Light Modulation® (LM) sessions of 20', each 10 days, the first one after the US seance

**PSR 2**: prevention intensive protocol

- 4 Light Modulation® (LM) sessions of 20', the first one after the US seance, the other each 10 days during the periodontal therapies

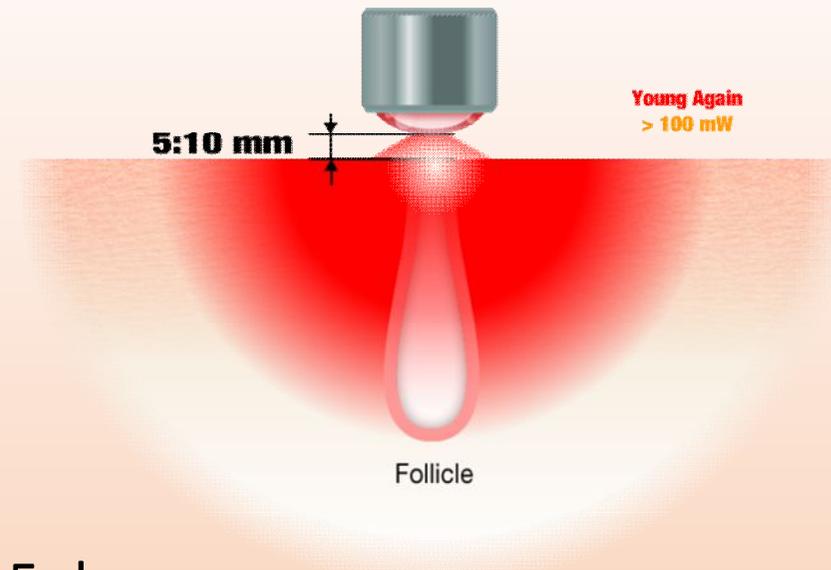
**PSR 3 to 4**: adjuvant protocol to

- Mechanical non surgical therapy (US + FS)
  - Pharmacological therapy
  - Surgical therapy
- 6 Light Modulation®(LM) sessions of 20', each 7 days, the first one after the US seance during the periodontal therapies

# Results

## Surgical patients:

- **Post surgical healing** time was of 5 days on average, **post-op oedema** and **inflammation** were **reduced accordingly**.
- **Post operative pain** was **significantly reduced**: 1-2 points on a 10 points VAS score.



# Conclusions

- IR led lights can be safely administered extraorally without losing their efficacy in accelerating oral post-surgical healing processes and in helping therapeutical periodontal procedures alike.
- A better oral hygiene by the patient can thus be obtained with decreased levels of inflammation and bleeding.



# Conclusions

**Many advantages of an extraoral approach of an IR device can be appreciated:**

- Clean procedure
- No need for operator to standby  
(treatment self-administration, time saving)
- All teeth can be treated simultaneously

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