



# ACADEMY OF DENTAL LEARNING & OSHA TRAINING

## Tooth Whitening: Comprehensive Review and Clinical Guidelines

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## Tooth Whitening: Comprehensive Review and Clinical Guidelines

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## Objectives

Upon completion of this course, the student should be able to:

- List the types of staining that occur, and explain the differences between extrinsic and intrinsic staining.
- Describe the mechanisms by which various whitening agents work while understanding safety and effectiveness of various techniques.
- Understand the common side effects of whitening agents and how to manage tooth sensitivity.
- Know the factors to teach patients about various tooth whitening techniques and good chairside communication.



## Introduction

Whitening teeth is not a new practice in dentistry, yet in recent times has grown in popularity, and is now one of the most frequently requested procedures in a modern dental practice. Most patients desire an attractive smile, so a pleasing tooth color is a symbol of oral health to many people. Many patients approach dental treatment for the first time with whitening teeth as a primary motivator, since a healthy smile and appearance may improve self-image, increase self-confidence, and have a positive impact on the quality of life. The practice building aspects for a dental office are also important.

Tooth whitening is essentially an esthetic change for a dental patient. And many times is an optional, elective procedure that has the potential of improvement of personal appearance. Yet tooth whitening also has risks and side effects which will be discussed in the body of this course. Results are not always predictable or successful, and depending on several factors and a color relapse can be expected. A patient's lifestyle and compliance are also factors. And patients will ask about the many options available including the techniques used in the office and at home, which lightens and brightens teeth. Dental professionals must be well versed in the explanations of the various procedures, and be able to explain the various aspects, in understandable language, to the patient about various products and procedures.

This course emphasizes in-office treatment situations, with the understanding that various over-the-counter (OTC) treatments, performed by the patient at home has some parallels. The concentration of chemicals is less with OTC products yet the effects of home treatment may be similar.

## History

The practices for teeth cleaning and attempts at lightening or changing tooth color dates back to ancient times. The Romans, Gauls, and others used urine as a mouth rinse to lighten teeth (Wikipedia, 2012). The Mayan civilization changed the color of teeth to black for religious ceremonies and placed colorful inlaid materials in anterior teeth. In 1864, tooth bleaching treatment was first noted for discolored, pulpless teeth (Wilkins, 2009).



And various materials have been used to lighten teeth, including:

- Oxalic acid
- Sodium hypochlorite (bleach)
- Hydrogen peroxide

All of these have been used alone or in combination, with or without heat activation. In the late 1960s, the era of the night guard bleaching tray began, interestingly in the specialty of orthodontics, and soon spread to general dentistry. (Wilkins, 2009) In 1989, the method of prescribing the common place use of carbamide peroxide in a mouth guard, using 10% carbamide peroxide worn overnight for tooth lightening was published (Haywood, 2006).



Currently, the number of patients seeking to attain whiter and brighter teeth continues to grow, and “tooth whitening” booths can even be found in shopping malls in some states. Undoubtedly, whitening procedures have become some of the most common dental treatments, and patients now seek the quickest most effective way to whiten teeth, by use of products which are easy to use, and have the fewest side effects. To address that need, dental researchers have developed new shade guides and restorative materials to treat the patient who desires lighter teeth than the lightest shades previously available. Professional guidance and judgment is indicated to address appropriate and achievable levels, while also incorporating the desires and expectations of the patient.

## **Key Terms**

An understanding of the key terms and definitions is necessary for all dental professionals. Those key terms include:

**Abfraction:** the pathologic loss of hard tooth substance cause by biomechanical loading forces. The loss is thought to be due to flexure and chemical fatigue degradation of enamel and/or dentin at a location distant from the actual point of loading.

**Bleaching:** a cosmetic dental procedure that uses a bleaching solution to whiten teeth.

**Color:** a phenomenon of light of visual perception that enables the differentiation of otherwise identical objects. Usually determined by measurement of hue, saturation, and luminous reflectance of light.

**Esthetic:** pertaining to the study of beauty and the sense of beautiful; objectifies beauty and attractiveness, elicits pleasure.

**Extrinsic:** external, extraneous, as originating from or on the outside.

**Iatrogenic:** resulting from the activity of a clinician; disorders induced in the patient by the clinician.

**Intrinsic:** from within, incorporation of a colorant within a material.

**Microabrasion:** a proven method for treating tooth discoloration by micro- reduction of superficial enamel through various methods or mechanical and/ or chemical actions.

**Psoralen:** a compound that absorbs ultraviolet radiation, and is used to treat skin problems such as psoriasis, eczema, or alopecia—and facilitate whitening of teeth.

**Synergism:** when the combined effects of the interaction of elements produces a greater total effect than the sum of the individual elements.

**Translucency:** having the appearance between complete opacity and complete transparency; partially opaque.

## **Classifications of Staining**

- Intrinsic
- Extrinsic
- Combination of both types

### **Intrinsic Stains**

Prior to eruption and during development, colorations are incorporated into the dentin. After eruption as aging occurs, the enamel thins and the darker enamel underneath shows through.

Factors and causes of intrinsic staining include:

- Pulp necrosis due to abscess of tooth
- Attrition, incisal and occlusal wear which exposes the underlying darker dentin
- Iatrogenic causes: some dental restorative materials can stain teeth.
- Secondary dentin and dentinal sclerosis affects light transmission which can cause the tooth to appear darker.
- Medication during development of permanent teeth.
- Trauma to primary or permanent teeth
- Aging changes
- Accumulation of stain permeating the teeth
- Fluorosis causing enamel defects.

Treatment:

- Chemical tooth bleaching procedures.
- Restorative procedures such as crowns, veneers, or composite restorations.

## **Tooth Whitening and Intrinsic Staining**

### **Traumatized Permanent Teeth**

Teeth with a history of trauma and endodontic staining can gradually darken. Treatment options include veneers for mild cases or crowns. A less invasive approach is to use an internal “walking bleach” method, and sometimes in conjunction with external bleaching to get the desired effect for the patient. The gutta percha is removed to the level of the bone past the CEJ and a leak free coronal seal for the root canal is maintained, because it has been reported that hydrogen peroxide that leaks into the gutta percha can lead to cervical resorption. Several well-known manufacturers have whiteners for this whitening method. Internal bleaching has resulted in a success rate of up to 90%.



### **Trauma/Infection of a Primary Tooth**

Infection in, or trauma to a primary tooth, as well as childhood diseases such as measles can result in the appearance of white or mottled areas on a permanent tooth. Some success is possible with microabrasion or etching techniques.



## **Tetracycline Staining**

This type of intrinsic staining is characterized by a greyish or yellow staining of the permanent dentition. Typically it presents as a band-like discoloration, although not at the gingival third of the teeth. This type of intrinsic staining is resistant to tooth whitening and typically requires more complex and lengthy whitening treatments. The most effective treatment span is one to six months, and is coupled with high concentrations of enzymes—specifically peroxidase and lactoperoxidase—with a 10-20% carbamide peroxide application.



## **Fluorosis/ Enamel Surface Defects**

Selective abrasion and microabrasion of superficial enamel defects combined with in-office or home-use are effective with superficial enamel defects.



## **Aging**

Gradual yellowing of the teeth occurs during adulthood as a natural aging process and due to penetration of staining agents such as tobacco and red wine. Geriatric patients can also show an increase in greying or yellowing which is due to internal anatomic changes within the tooth. As a patient ages, the enamel thins and the dentin thickens, resulting in a yellow, more dense appearance.

## Extrinsic Stains

After eruption stains often occur on teeth. Extrinsic stains attach to the tooth surface and in the biofilm on the surface of the tooth.

Factors and causes of extrinsic staining include:

- Foods: coffee, tea, red wine, blueberries, carrots, oranges and dark colas



- Drugs: chlorhexidine containing products, liquid antibiotic preparations such as amoxicillin, doxycycline, minocycline.



- Habits: tobacco use, betel leaf chewing.



### Treatment:

- Removal of surface, extrinsic stain by scaling and polishing.
- Thorough self-cleaning on a daily basis.
- Smoothing of superficial enamel defects.
- Silica containing dentifrice with covarine blue.
- Use of carbamide peroxide/ hydrogen peroxide for whitening & bleaching effect



## **Extrinsic Whitening**

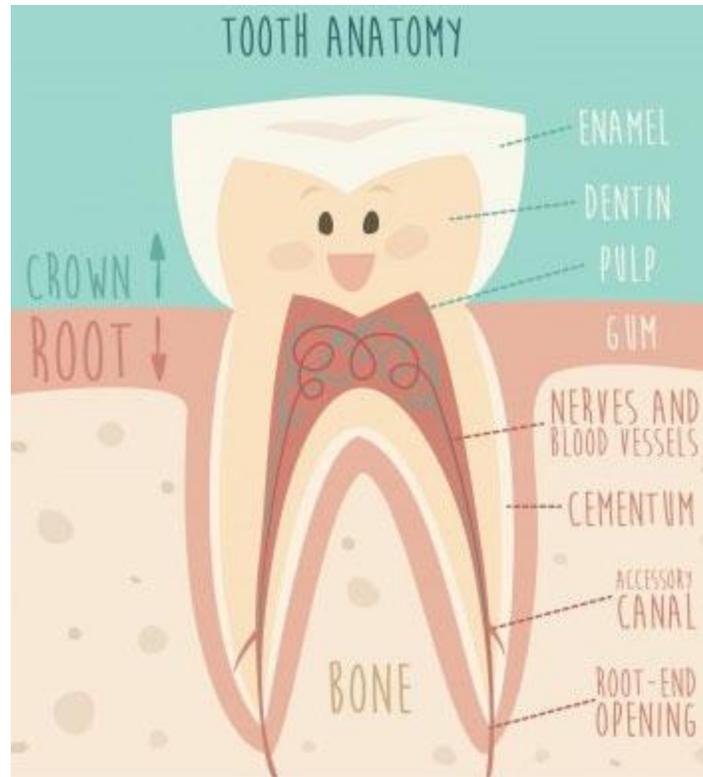
### **Tooth Whitening of Extrinsic Staining with Dentifrices**

Tooth whitening dentifrices typically contain fine, rounded abrasives and have a relative dentin abrasivity (RDA). Whitening dentifrices gently remove superficial stains and smooth out microscopic defects that alter light properties that may result in a darker appearance. Dentifrices that contain amorphous calcium phosphate (ACP) also has a whitening effect by filling in the microscopic tooth irregularities, so that the teeth appear whiter. And recently, silica containing dentifrices with blue coravine has been studied and is found to reduce tooth yellowness and increase whiteness immediately after brushing, and is effective in removal of extrinsic stains (Collins, 2008).

## **Intrinsic Whitening**

[Shared from Dr Mark Burhenne, of Ask The Dentist, <http://askthedentist.com/teeth-whitening-know-before-you-go/> ]

“Intrinsic” refers to whitening the inner part of the tooth, which soaks up hydrogen peroxide gel (also called whitening gel or bleach) and becomes lighter.



When the inner part of the tooth is whitened, the color that's reflected through the outer enamel of your teeth is lighter, making them look whiter and brighter—reflecting out through the enamel like a prism.

Contrary to what you might have thought, bleach lightens the inner tissue of the tooth, not the hard, outer enamel.” ~Dr Mark Burhenne

## **Intrinsic Tooth Whitening: Vital and Non-Vital**

### **Vital Teeth**

This category of tooth whitening uses different, yet similar methods although the mode of delivery, length of treatment, and ease of treatment differs. The types are:

- Professionally Applied
  - Applications of 30-40% hydrogen peroxide or 35-44% carbamide peroxide
  - Activation with a light or heat source
  - Heat source may cause an adverse effect
  - May take 1-6 treatments to achieve desired results
  - 30-60 minute treatment



- Professionally Dispensed
  - Called night guard bleaching, external bleaching, at-home bleaching
  - Requires custom tray preparation
  - Patient instruction and compliance with time requirements of 1-2 weeks, touch-up every 6 months-2 years depending on patient.



- Over the Counter (OTC)
  - At home products
  - Based on various concentrations of carbamide peroxide or hydrogen peroxide
  - Delivered in various packaging, viscosities, flavors

## Whitening Strips

Dr. Mark Burhenne DDS, of Ask The Dentist shares his wisdom:

“Whitening strips are small pieces of a flexible plastic called polyethylene. Each flexible strip is coated in a whitening gel that contains hydrogen peroxide or carbamide peroxide. You take each strip and mold it around your teeth — one strip for the top, and one strip for the bottom. The peroxide gel in the strips is now held up against the teeth, so it can seep into the teeth to lighten them. White strips work, but often give uneven results. Since strips are 2-D, they do a poor job of getting into the curves in between teeth, which can make your teeth look whiter on their flat surfaces, but yellower at the edges. If you have crooked teeth, even results will be hard if not impossible to get.

Pros: They’re readily available at drugstores and on Amazon, easy to use, and get results within a few days or weeks. A lot of people would consider it a “pro” that you don’t have to see your dentist to get them, but if you haven’t been to the dentist in a while and you have a cavity and the whitening materials get within that cavity, it can cause excruciating pain.

Risks: Whitening strips can be dangerous because they are not custom-fit, so the whitening chemicals come into contact with the gums and other tissues in the mouth. When whitening strips touch other live tissue, you have free radical reactions—those are the reactions the speed up the aging process. With trays you make yourself or with whitening strips, you’re holding oxidant against living tissue which causes a reaction that is unsafe and is creating free radicals in the mouth.” [<http://askthedentist.com/teeth-whitening-know-before-you-go/>]



## Non-Vital Teeth

This category of tooth whitening is also called “walking bleach”, and usually performed on a single, endodontically treated tooth that is discolored.

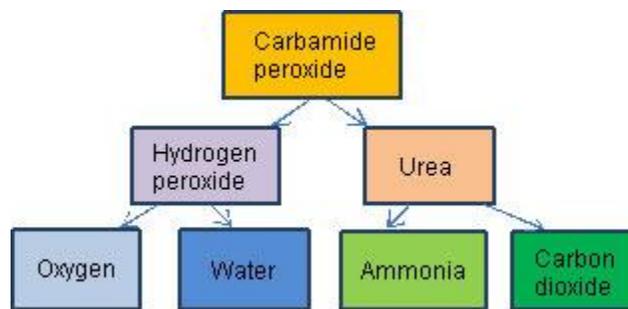
- Performed by a dentist in a treatment room
- Hydrogen peroxide and /or sodium perborate is placed in a pulp chamber, sealed and left for 3-7 days.
- Results usually last longer than external tooth whitening. (Wilkins, 2009)



## Chemistry of Tooth Whitening Agents

The active ingredient in most whitening systems is hydrogen peroxide. Hydrogen peroxide is used directly or produced through a chemical reaction from carbamide peroxide or sodium perborate or titanium dioxide.

The breakdown of carbamide peroxide is shown in the figure below:



## Use of Lights & Laser

Some in-office treatments use a whitening light, with the objective of speeding up the whitening process. The use of light is controversial, with some studies finding that it increases the effectiveness and speed of the procedure, and other studies finding that it has no visible effect. Based on evidence to date, the use of light enhancement may be optional.

Laser tooth whitening has also been studied for speed and efficacy and has not been found to be substantially more effective. Also, concerns have been raised regarding increases in intra-pulpal temperature and increased sensitivity with the use of lights and lasers for enhanced in-office bleaching. Light-assisted whitening may increase the risk of micro-leakage. Even though research is not definitive on the use of light enhanced bleaching, the patient expects its use. If light is not used, the patient may wonder if the proper care is being administered. The pros and cons of patient satisfaction and marketing are all considerations for this popular and frequently requested procedure in a modern dental office.



## Indications for Whitening and Methods of Treatment

Indication	Method to Treat
Discolored, endodontically treated tooth	Internal bleaching: In office or walking
Single or multiple discolored teeth	External whitening: In office 1-3 weeks or custom trays worn 2-6 weeks
Surface staining	Brushing with a whitening dentifrice
Isolated brown or white discoloration, shallow depth in enamel	Microabrasion followed by neutral sodium fluoride applications
White discoloration on yellowish teeth	Microabrasion followed by custom tray whitening
(Sarrett, 2002)	

## Contraindications for Whitening

- Teeth which seem at an acceptable shade, which is subjective for clinician and patient.
- Presence of composite restorations, mixed with natural tooth structure which will not lighten with treatment.
- Porcelain restorations such as crowns and veneers will not lighten, and may require replacement after whitening treatment.
- Patient who is photo-sensitive or using photo-sensitive medications and use of whitening procedures that incorporates a light or laser during treatment.

- Caution with patient selection and safety concerns, with children and adolescents with consideration for whitening in cases of negative self-image.
- Pregnant or lactating women.
- Patients who are unable to be compliant.
- Patients with unrealistic expectations.
- Patients with exposed cementum and exposed root surfaces. Cementum does not lighten.
- Patients with bonding planned within 2 weeks of the whitening since decreases the effect of the bonding process.
- Patients with GERD or whom experience increased acids in their mouth, often, which can lead to weak enamel, higher decay rate and/or increased sensitivity.

#### Factors that Influence the Outcome of Treatment

- Initial color of teeth
- Patient age
- Patient with unrealistic expectations
- Concentration of whitening agents
- Ability of agent to reach stain molecules
- Duration of contact of the whitening agent.
- Number of applications since darker teeth will require more treatments.
- Teeth with discolored dentin.

#### **Patient Preparation**

- Patient assessment including medical history & identification of contraindications
- Complete oral exam including oral cancer screening and periodontal evaluation.
- Clinician chooses appropriate whitening procedure and plans for overall approach
- Discussion of procedure, risks, and realistic results.
- Obtain consent signature
- Review instructions if whitening is for home use.
- Determine initial shade and confirm with patient; confirm with photograph to record starting shade of teeth.
- Clean teeth thoroughly of all deposits, including calculus and extrinsic stain.
- Premedication with an anti-inflammatory pain medication, if indicated, such as a non-steroidal medication (NSAID)
- Plan for maintenance and follow up



## Potential Side Effects

Tooth whitening is generally a safe and effective treatment but there are side effects and risks. The acidic nature of agents and the dehydrating effects of glycerin in the gel formulations may contribute to tooth sensitivity. There are several potential side effects experienced by the patient associated with tooth whitening procedures:

- Tooth sensitivity
- Soft tissue irritation
- Irreversible tooth damage
- Effects on dental materials
- Demineralization (dimension article)
- Safety and systemic effects

### Tooth sensitivity

Many patients who undergo whitening treatment experience some level of dentinal hypersensitivity that can interfere with their ability to complete treatment. Some patients describe a tingling sensation; others may describe an aching feeling. The side effects can last for days to months but usually resolves completely in a short period. Some patients who bleach at home, may terminate the home applications prior to completion.

The most commonly agreed upon cause of dentinal hypersensitivity is the hydronamic theory, or fluid movement in the dentinal tubules. Some researchers believe the cause is the penetration of hydrogen peroxide into the structure of the tooth, resulting in agitation of the nerve receptors. Light and heat may also be factors which count as irritants. Prevention and management are the dental professionals best tools to minimize tooth sensitivity.

There are numerous desensitizing agents that can be incorporated directly into the whitening gel or are applied separately before and after the procedure is completed.

Desensitizing agents include:

- Fluoride: Occludes dentinal tubules by creating a barrier with calcium fluoride crystals on the tooth surface.
  - Potassium nitrate: Acts directly on intra-dental nerves, causing depolarization, thus preventing pain transmission. Available in many over the counter toothpastes.
  - Calcium phosphate: Counters demineralization by increasing the mineral density of the tooth.
  - Arginine calcium carbonate: Binds to tooth surface and creates resistance to pulpal pressures.
- (Muzzin, 2018)

### Management of Tooth Sensitivity for Whitening Procedures

<b>Pretreatment</b>	<ul style="list-style-type: none"> <li>✓ Brush on or use a tray with a desensitizing toothpaste</li> <li>✓ containing potassium nitrate, without sodium lauryl sulfate, which removes smear layer from dentin, beginning 2 weeks prior to whitening</li> <li>✓ Use toothpaste with prescription strength sodium fluoride.</li> <li>✓ Use toothpaste that includes calcium carbonate.</li> </ul>
<b>During</b>	<ul style="list-style-type: none"> <li>✓ Continue to use desensitizing toothpaste, which includes sodium fluoride or potassium nitrate, daily.</li> <li>✓ Increase time intervals between treatments.</li> <li>✓ Reduce exposure time of the whitening materials.</li> <li>✓ Limit the amount in tray to prevent tissue contact.</li> </ul>
<b>Post-whitening</b>	<ul style="list-style-type: none"> <li>✓ Sensitivity diminishes with time.</li> <li>✓ Continue daily use of desensitizing dentifrice.</li> <li>✓ Apply professional fluoride varnish application.</li> <li>✓ Avoid foods and drinks with temperature extremes or that contain acidic elements.</li> </ul>
(Haywood, 2006)	

### Soft Tissue Irritation

Hydrogen peroxide is caustic and may cause burning and bleaching of the gingiva and any exposed tissue. This is frequently caused by ill-fitting trays rather than the whitening agents. Remind patients to NOT overfill trays with product, to not only minimize wasting product, but more importantly, to prevent irritations to unintended bleach in areas in mouth not intended for bleach: surrounding gingival tissues, tongue, recession areas.



**PROTIP:** Hygienists have been known to, first have patients wipe away any excess bleach that may be spilling over the trays, as patient wears them, with cotton swabs. Then have patients apply Vaseline® with additional, clean cotton swab/s to any areas of sensitivity, while bleaching, to include any exposed root surfaces, or gingivae affected by bleach product, so as to prevent bleach from adhering/absorbing to areas of concern.

## **Irreversible Tooth Damage**

There are two types of irreversible tooth damage associated with whitening procedures and which may lead to tooth loss:

### 1. Root resorption

- Can occur particularly with non-vital tooth bleaching when heat is applied during the technique.
- Internal and external resorption may become apparent several years after whitening.
- Occurs usually in the cervical third of the tooth, therefore avoiding agents on cementum is necessary during application.
- May be related to trauma

### 2. Tooth Fracture

- May be related to removal of tooth structure or reduction of the micro-hardness of enamel (Wilkins, 2019)

## **Effects on Dental Materials**

- Bonding of adhesively attached restorations to recently a whitened tooth surface is significantly reduced.
- Whitening chemicals that contain hydrogen peroxide may have a negative impact on restorative materials.
- May increase mercury release from amalgam restorations.
- May increase solubility of some dental cements.

## **Remineralization**

This is a process where calcium and phosphate ions are supplied from an external source to deposit in crystal voids in demineralized enamel. Manufacturers have included fluoride, potassium nitrate, amorphous calcium phosphate (ACP), casein phosphopeptide-ACP, calcium sodium phosphosilicate, and tricalcium phosphate to promote remineralization, as well as reduce tooth sensitivity after whitening. Studies

are inconclusive, and application of fluoride has been demonstrated to be effective in restoring the mineral content and microhardness values back to a baseline level. (Kwon, 2018)

### **Safety and Systemic Effects**

The use of tooth whitening products containing hydrogen peroxide and carbamide peroxide does not appear to pose an increased risk of oral cancer in the general population, including those persons who are alcohol abusers and/or heavy cigarette smokers.

Accidental ingestion of small amounts can cause sore throat, nausea, vomiting, abdominal distention, and ulcerations of the oral mucosa, esophagus, and stomach. (Wilkins, 2019)

### **Patient Education**

All patients need education about whitening to avoid complications with treatment, whether it be OTC or in-office applications.

The following are points to have in a written format for the patient and to be reinforced at chairside:

- ✓ Need for complete examination
- ✓ Awareness of possible sensitivity from various whitening treatments.
- ✓ Proper use of desensitizing products.
- ✓ In-office versus home treatments. In-office may produce more sensitivity.
- ✓ Color relapse may occur.
- ✓ Excessive use of whitening products may be harmful.
- ✓ Existing restorations will not change color.
- ✓ Need for periodic reapplication of whitening treatment.
- ✓ Caution is urged for treatment longer than a few weeks.
- ✓ Do not swallow any whitening materials.

(Christenson, 2005)

### **Latest Trends in Teeth Whitening**

Though the allure of cheaper quicker accessible options to whiten ones teeth is often admitted by many patients, it is our job to ensure patients are aware and leery of many over-the-counter methods, as well as, harmful trends. As of 2019, these are many of the latest ways patients are exposed to and often inquire about for teeth whitening:

## **Activated Charcoal**

Patients are finding instructions online to brush it onto teeth, poured out onto toothbrush from a capsulated form, for 1-2 minutes, in a circular motion. Expectorate and rinse thoroughly. Using this at-home to whiten teeth may also leave tooth enamel susceptible to deterioration and erosion, which can lead to sensitivity and cavities. In an online publication dated August 2019, Dr. Susan Maples, a Michigan-based dentist, said “the difference between using an approved dental tool, whether at home or at the dentist’s office, and a DIY remedy like charcoal lies in their approaches. For example, approved products seep through the enamel and into the inner layer of the tooth called the dentin, which influences tooth color. Users and dentists don’t know how severe the charcoal supplement may be, so it may leave teeth stained or blotchy. The trendy product may also leave tooth enamel susceptible to deterioration and erosion, which can lead to sensitivity and cavities.”

## **Coconut Oil/Oil Pulling**

According to LIVESCIENCE in a May 20, 2019 online publication by Alina Bradford, [it should be noted that] “the American Dental Association (ADA) criticizes existing studies as "unreliable" for a number of reasons, including: misinterpretation of results due to small sample size, absence of negative controls, lack of demographic information and lack of blinding. According to the ADA, ‘scientific studies have not provided the necessary clinical evidence to demonstrate that oil pulling reduces the incidence of dental caries [cavities], whitens teeth or improves oral health and well-being.’”

Shared from website: <http://www.skincareorg.com/teeth-whitening/coconut-oil-teeth-whitening-how-to-whiten-teeth-with-coconut-oil/>

Coconut oil does not whiten teeth by bleaching but rather with lauric acid which helps get rid of plaque and bacteria- major contributors to yellow teeth. Coconut oil contains medium chain fatty acids with 50% being lauric acid. Lauric acid has proven anti-inflammatory and antimicrobial properties which help to get rid of plaque and bacterial on the teeth and gums. It also helps to keep your breath fresh.

### *Coconut Oil Teeth Whitening Instructions*

1. Start with a teaspoon of coconut oil. Place it in your mouth and allow it to warm until it liquefies
2. Swish the oil in your mouth for 15-20 minutes making sure it covers all the areas of your teeth and gums. DO NOT gargle
3. Spit out the oil in the toilet or trash can not in the sink- it can clog drains
4. Rinse out your mouth with warm water and brush as usual
5. Do this every day or a few times a week

## **Teeth Whitening Pens**

Whitening gel is now on the market, both in-office and over-the-counter, in a pen-brush applicator. One in-office brand states it produces professional level whitening results of up to three shades in just seven days. The product whitens by the discharge of active oxygen to remove tooth stains and deeper discolorations of the enamel. The product is easy to use and application is complete in five easy steps.

To complete the whitening procedure, the patient completes the following steps:

- Brush and floss all teeth.
- Turn dosage wheel on applicator wand to expel gel onto the brush tip.
- Apply a thin layer of gel to each tooth.
- Allow whitening gel to sit on teeth for eight to 10 minutes.
- Rinse mouth with warm water after application.

Per Donna Solovan-Gleason, RDH, PhD, of RDH magazine, “the procedure is simple to complete, economically priced, and produces whitening results quickly, thus increasing patient compliance. The brush-on technique minimizes tissue sensitivity, which is often a factor that affects the patient being able to use a whitening product at home on a daily basis for a short period of time. Convenient home use and minimal application time further encourage patient compliance for completing the whitening regimen.”

## **Conclusion**

Tooth whitening is valued by patients as a desirable esthetic treatment. Many treatment options are available for tooth whitening so the dental professional needs to be able to identify good candidate for whitening procedures. It is important for the patient to understand these options and be educated about the best treatment options based on their individual evaluation. All members of the dental team need to be able to answer fundamental questions and provide patient instructions before, during, and after treatment. And while tooth whitening has been proven to be safe and effective, is best office practice to use good informed consent procedures to manage patient expectations. Patients need to be counseled with instructions, post-treatment, to avoid heavily pigmented foods and beverages. Since the most common side effect is transient tooth sensitivity during the whitening process, it is important to manage hypersensitivity with the proper desensitizing agents which contain fluoride and/or potassium nitrate.

Once the preliminary issues and patient expectations are addressed, the actual clinical implementation of the tooth whitening procedure is straightforward, a good marketing tool, and adjunct to other cosmetic treatments.

“The most important point to get across to our patients and the public in general is that a white, beautiful smile is reflective of a healthy mouth. Whether directly or indirectly, we [Dental Professionals] need to and should be a part of the whitening equation. We promote and emphasize the benefits of professional involvement with regard to bleaching because we want our patients to realize this: The benefits of comprehensive care are many, not least of which is to accentuate and maximize their whitening investment.” Dr. Stacey Simmons, January 2015, Dental Economics

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## **Tooth Whitening: A Comprehensive Review and Clinical Guidelines Course Test**

1. Intrinsic staining is the type that occurs from within the tooth.
  - a. True
  - b. False
2. Intrinsic staining may be caused by all of the following, except:
  - a. Aging
  - b. Fluorosis
  - c. Trauma
  - d. Chlorhexidine mouth rinse.
3. The active ingredient in most tooth whitening systems is hydrogen peroxide.
  - a. True
  - b. False
4. The objective for the use of lights or laser in tooth whitening is to:
  - a. Control the process.
  - b. Speed up the process.
  - c. Avoid tooth sensitivity.
  - d. Decrease micro-leakage.
5. A discolored, endodontically treated tooth is best treated in-office, or “walking bleach” techniques.
  - a. True
  - b. False
6. Tooth bleaching on patients is allowed without an examination by the dentist.
  - a. True
  - b. False
7. Patient preparation for tooth bleaching includes:
  - a. Complete medical history and examination.
  - b. An informed consent signature by the patient.
  - c. Determination of the initial shade prior to treatment.
  - d. All of the above.

8. Potential side effects include all of the following, except:
  - a. Tooth sensitivity
  - b. Soft tissue irritation
  - c. Reversible tooth damage
  - d. Demineralization
  
9. Tooth whitening procedures have no effect on the ability of bonding materials to adhere to tooth structure.
  - a. True
  - b. False
  
10. Factors to teach patients for good chairside communication, include:
  - a. Color relapse may occur.
  - b. Excessive use of whitening products may be harmful.
  - c. Tooth sensitivity management.
  - d. All of the above.