

## Introduction

Aesthetic and conservative management of arrested caries lesions is not well explored in literature. Bleaching has shown promising results as an aesthetic and a non-invasive approach, yet the possibility of re-staining which may affect the bleaching outcome, have not been investigated.

## Objective

To investigate (1) the efficacy of two different dental bleaching systems on stained-arrested caries lesions; and (2) to assess the susceptibility of the bleached lesions to staining.

## Materials and Methods

### Study design:

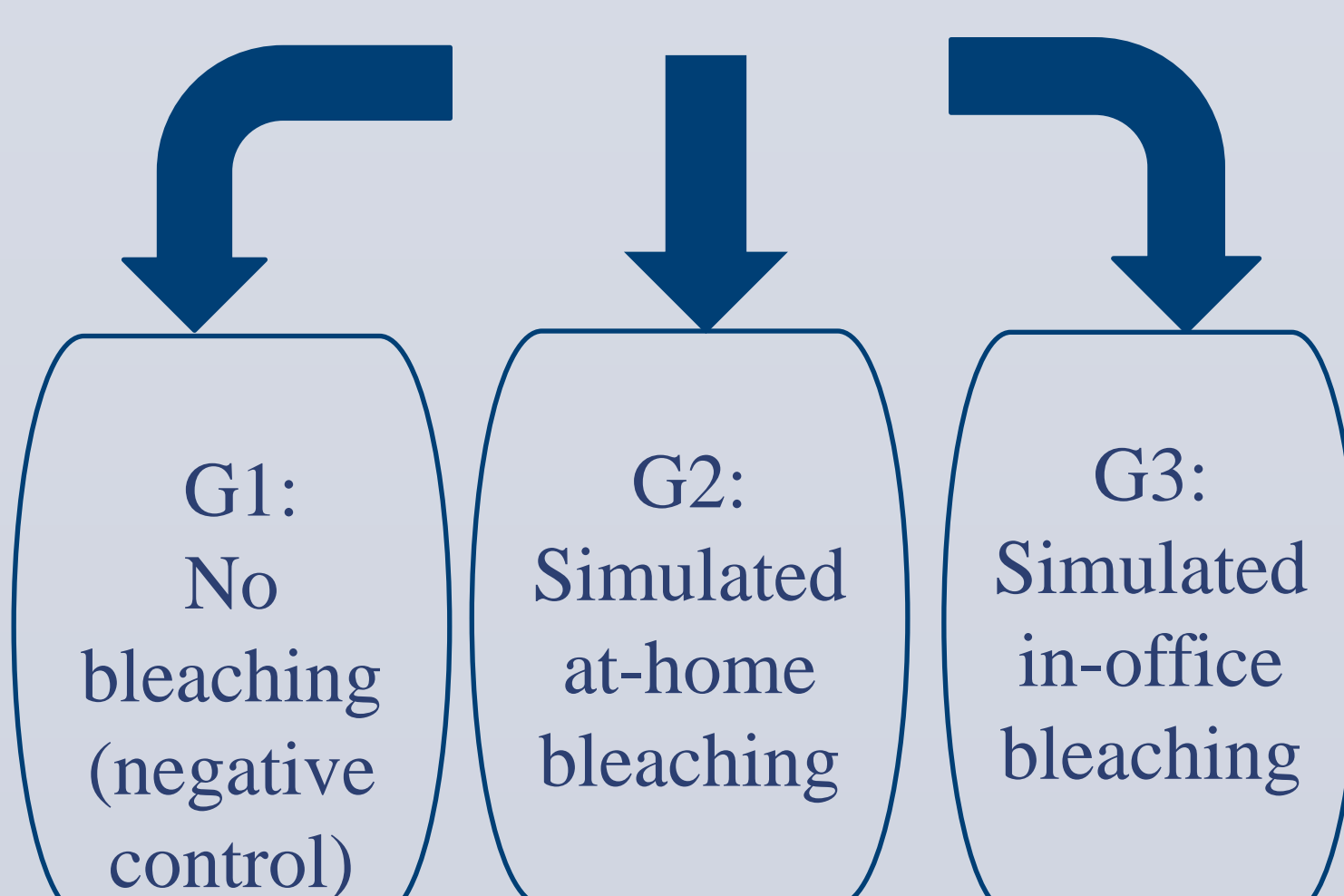
The experimental units were 60 human teeth with stained arrested caries lesions (pit and fissure surface) embedded in acrylic blocks (n= 20 per treatment group).



Baseline color was measured spectrophotometrically.



Then, specimens were randomized into 3 groups (n=20) based on the bleaching protocol used.



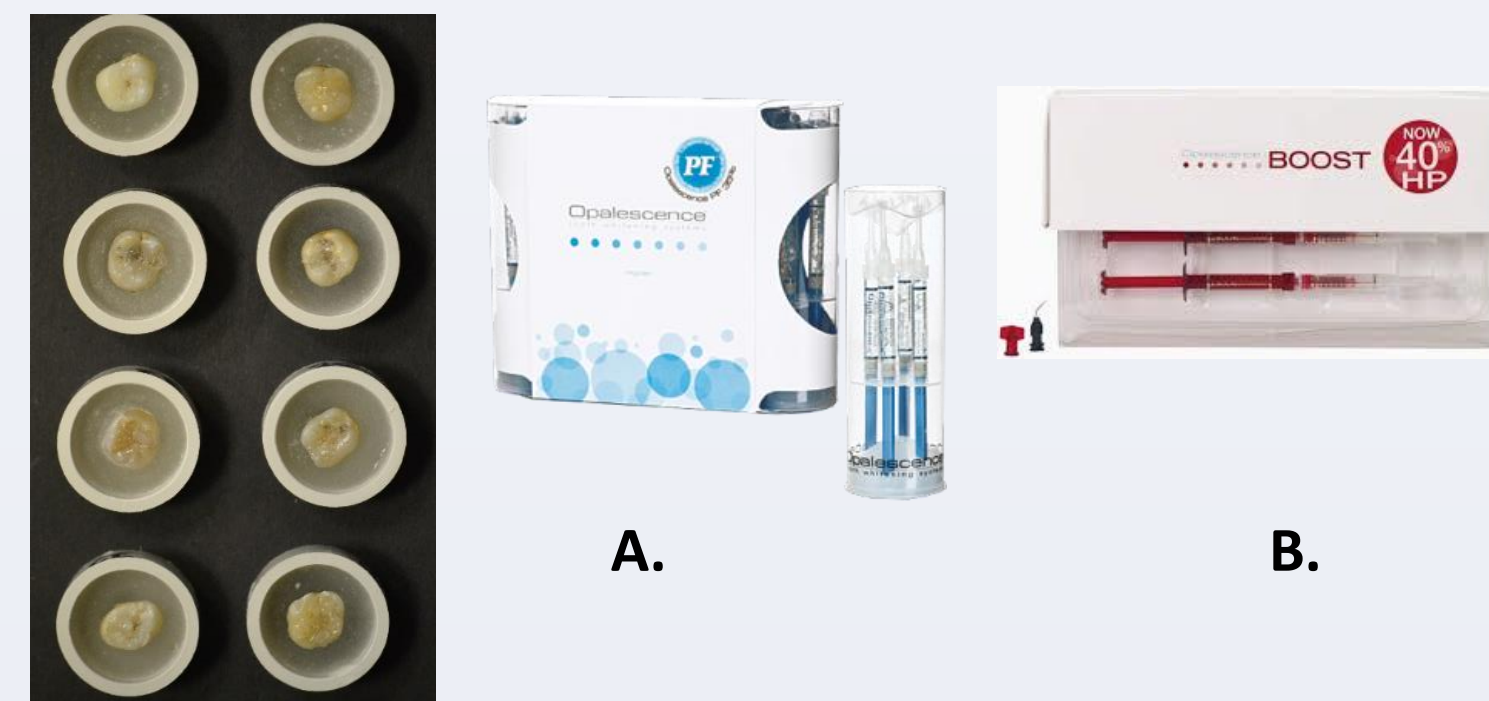
### 1. Bleaching test:

#### A. At-Home bleaching:

15% carbamide peroxide, 4h/d ×7.

#### B. In-office bleaching:

40% hydrogen peroxide; 20min ×3.



### 2. Staining test:

Specimens were subjected to staining (combination of coffee and tea solution; 8h/d×5), in an incubator at 37°C.



The study outcome was color change ( $\Delta E$ ), measured spectrophotometrically at 3 time points:

Baseline, after bleaching and after staining.

### Statistical analysis:

Data were analyzed using ANOVA models followed by Dunnett T3 tests ( $\alpha=0.05$ ).

## Results

### Color:

At-home bleaching protocol significantly ( $p<0.001$ ) improved the color lightness ( $\Delta E$  7.6) of stained arrested caries lesions, compared to in-office bleaching protocol ( $\Delta E$  3.2) and control ( $\Delta E$  3.7).

### Re-staining susceptibility:

After staining, both at-home ( $\Delta E$  8) and in-office bleaching groups ( $\Delta E$  7.3) produced a significant ( $p\leq 0.009$ ) increase in stains absorption (darker) compared to the control group ( $\Delta E$  3.1), indicating more surface stain deposition.

**Table 1. Color change ( $\Delta E$ ) means (standard-deviation) after bleaching and staining.**

Groups	$\Delta E_{\text{Bleaching+}}$		$\Delta E_{\text{Staining+}}$	
	Mean	SD	Mean	SD
G1 (control)	3.2 (1.9)	A/a	3.1 (1.7)	A/a
G2 (At-home bleaching)	7.6 (4.1)	A/b	8.0 (3.4)	A/b
G3 (In-office bleaching)	3.7 (2.3)	A/a	7.3 (5.1)	B/b

- Uppercase letters indicate significant difference within treatment (row,  $p<0.05$ ); while lower case among treatments (column,  $p<0.05$ ).  
+ $\Delta E_{\text{Bleaching}}$ : bleaching-baseline,  $\Delta E_{\text{Staining}}$ : staining-bleaching.

**Figure 1. Visual color change for all groups at baseline, after bleaching and after staining.**



## Conclusion

At-home bleaching protocol was significantly more efficient in color improvement (lighter color) compared to in-office bleaching protocol when treating stained arrested caries lesion; however, both bleaching protocols resulted in higher surface stain absorption.

## Clinical significant

The expected results will help clinicians to carefully consider selecting appropriate arrested caries lesions cases as well as the type of bleaching agent, based on the effectiveness to manage such lesions in a conservative and aesthetic approach.

## References

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