Academic year 2021./2022.

Experimental and clinical evaluation of teeth bleaching procedures

Department of Endodontics and Restorative Dentistry

Total ECTS points

Associate professor Eva Klarić

Mario Rakić, PhD

Teaching plan

	No. classes
Lecture	5
Seminar	4
Practical	5
Total	13

1 class = 45 minutes

Course description

Learning outcomes

1. Explain methods for investigating physico-mechanical properties and chemical composition of hard dental tissues after bleaching
2. Analyze techniques for preparation of samples for microhardness, surface and change in chemical composition of hard dental tissues
3. Define different methods for *in vivo* and *in vitro* evaluation of optical effect of teeth bleaching
4. Evaluate and compare different methods for evaluation of biological aspects of teeth bleaching

Course contet

Course "Experimental and clinical evaluation of teeth whitening procedures" provides basic principles and methods of *in vitro* and *in vivo* research on the effect of teeth bleaching on hard and soft dental tissues, restorative materials as well as on the technique of evaluating the optical bleaching effect. This subject will also provide insight into the biological basis of bleaching, through modern techniques and bleaching materials. During the lectures, the students will be introduced to various methods of examining the effect of teeth bleaching on physico-mechanical, aesthetic and biological properties of hard tooth tissue and restorative materials, explaining the scope and limitations of specific scientific procedures as well as the possibility of using a specific methodology in the scientific part of the field of teeth bleaching. The aim of the seminar is to introduce students with different techniques and materials for teeth bleaching and reduction of hypersensitivity with respect to the results of scientific research, which will also explain the clinical methods of assessing the effect and patient satisfaction during and after bleaching treatment. During practical part of the course, students will have the opportunity, during laboratory work, to familiarize themselves with the ways of preparing samples for microhardness measurements, change in surface and chemical composition of

hard tissue and optical measurements, while demonstrating and enabling work on devices to evaluate the above-mentioned properties.

Lecture

	Lecture topics	**Number of classes/hours**
1.	Tooth bleaching – biological aspects	1
2.	Tooth bleaching – techniques, materials and procedures	1
3.	Evaluation of teeth bleaching on hard and soft dental tissues	1
4.	Evaluation of optical effects of bleaching procedures	1
5.	Effects of bleaching agent on physical and aesthetic properties of restorative materials	1

1 sat = 45 minuta

Seminari

	Seminar topics	**Number of classes/hours**
1.	Clinical methods for evaluation of bleaching effectivnes	1
2.	Patient reported outcomes of bleaching effectiveness	1
3.	Materials for reduction of postoperative sensibility after teeth bleaching	1
4.	Evaluation of genotoxic effect of bleaching agents on oral mucosa	1

1 sat = 45 minuta

Vježbe

	practicals topics	**Number of classes/hours**
1.	Evaluation of physico-mechanical properties and chemical composition of hard dental tissues after bleaching	-
2.	Demonstration of laboratory methods for evaluation of optical effects of teeth bleaching procedures and device for real time local experimental monitoring of bleaching process	-
3.	Demonstration and work on light sources for experimental light-activated bleaching	-
4.	Preparation of samples for microhardness, surface and change in chemical composition of hard dental tissues	-
5.	Preparation of samples for evaluation of optical effects of teeth bleaching procedures	-
6.	-	-
7.	-	-
8.	-	-
9.	-	-
10.	-	-

1 class = 45 minutes

Literature

1. Linda Greenwall. Tehnike izbjeljivanja u dentalnoj medicini. Udruga arija, Zagreb 2011.
2. Jorge Perdigão. Tooth Whitening: An Evidence-Based Perspective. Springer, 2016.
3. So-ran Kwon, Seok-hoon Ko. Tooth Whitening in Esthetic Dentistry: Principles and Techniques. Quintessence Pub Co, 2008.
4. Zanolla J, Marques A, da Costa DC, de Souza AS, Coutinho M. Influence of tooth bleaching on dental enamel microhardness: a systematic review and meta-analysis. Aust Dent J. 2017 Sep;62(3):276-282.
5. Maran BM, Burey A, de Paris Matos T, Loguercio AD, Reis A. In-office dental bleaching with light vs. without light: A systematic review and meta-analysis. J Dent. 2018 Mar;70:1-13.
6. Martins I, Onofre S, Franco N, Martins LM, Montenegro A, Arana-Gordillo LA, et al. Effectiveness of In-office Hydrogen Peroxide With Two Different Protocols: A Two-center Randomized Clinical Trial. Oper Dent. 2018 Jul/Aug;43(4):353-361.
7. Joiner A, Luo W. Tooth colour and whiteness: A review. J Dent. 2017 Dec;67S:S3-S10.
8. Attin T, Hannig C, Wiegand A, Attin R. Effect of bleaching on restorative materials and restorations--a systematic review. Dent Mater. 2004 Nov;20(9):852-61.

CV (*curriculum vitae*) and bibliography of course leader

Eva Klarić was born on September 8, 1983 in Zagreb. In 2002 she enrolled at the Faculty of Dentistry, University of Zagreb, graduating in 2007. During her studies, she was awarded the Dean's Award for the academic year 2003/04. and the Rector's Award for the academic year 2006/07, and was included in the ten most successful graduate students in the year 2007/08. Since 2009 she has been employed as a research fellow at the Department of Endodontics and Restorative Dental Medicine. She received her doctorate in 2013. She passed the specialist exam in Endodontics and Restorative Dental Medicine in 2014. In 2016, she completed postgraduate specialist studies. She has been working at the Department of Endodontics and Restorative Dental Medicine since 2016-2021 as an assistant professor, and since 2021 she has been elected associate professor. She is the leader of the course Preclinical endodontics in English at the School of Dentistry in Zagreb, and several scientific projects. She has published a total of 37 papers, most of which are in journals indexed in WOS and Current Contents. The H-index according to the Web of Science is 10. He is also the author of a number of chapters in books and university textbooks. In 2013 and 2015, she won the award for Best Research Fellow at the Faculty of Dentistry in Zagreb. In 2013 she won the Award of the Society of University Teachers and Other Scientists in Zagreb for the best scientific work, and in 2016 she won the IADR Robert Frank Award for Senior Clinical Research. From foreign languages she speaks English and German. She is a member of the Croatian Chamber of Dental Medicine, the Croatian Endodontic Society and the International Association for Dental Research.

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