Academic year 2021./2022.

Course title: Experimemntal procedures for determining the efficiency of adhesive systems

Department: Department for endodontics and restoratoive dentistry

Adress: University of Zagreb School of Dental Medicine, Gunduliceva 5, 10000 Zagreb

Total ECTS points: 4

Course leader: Professor Zrinka Tarle

Course associates. -

Teaching plan

	No. classes
Lecture	6
Seminar	7
Practical	7
Total	

1 class = 45 minutes

Course description

Adhesion is defined as the joining of two independent material surfaces that are held in contact without the aid of external forces, i.e. as the joining of different materials by the attraction of atoms and molecules.

The basic mechanism of adhesion is based on the principle of exchanging the minerals removed from dental hard tissues with monomers that are micromechanically trapped in the resulting pores.

Physical and mechanical properties of adhesive systems are determined by their bond strength, tensile bond strength, shear bond strength, elasticity, hardness, polymerization shrinkage, and hydropic and thermal expansion. These properties determine the durability of the restoration.

The difference in the bonding of adhesive systems between enamel and dentin should be highlighted. In the context of bonding, the enamel is much simpler and reacts favorably to etching with orthophosphoric acid. During the acid-etching of enamel, the following processes take place: the dissolution of hydroxyapatite crystals and the removal of the chemically saturated enamel surface, glycoprotein sheath, and smear layer. In dentin, chemical bonding is attainable in addition to micromechanical retention. Bonding to dentin is achieved by the diffusion of the resin into open tubules of demineralized dentinal walls and the infiltration of the exposed collagen network.

In addition to theoretical knowledge, doctoral students will have the opportunity to actively present various seminar topics and get acquainted with experimental procedures for determining the effectiveness of adhesion systems.

Learning outcomes

1. Describe the concept of adhesive systems.
2. Critically evaluate the types of adhesive systems and compare their properties
3. Select and argue experimental procedures for determining the efficiency of adhesive systems

Course contet

Lecture

	Lecture topics	**Number of classes/hours**
1.	-definition, development and composition of adhesive systems	2
2.	-properties of adhesive systems	1
3.	-classification of adhesive systems	1
4.	-advantages and disadvantages of adhesive systems	2
5.	-	-
6.	-	-
7.	-	-
8.	-	-
9.	-	-
10.	-	-

1 sat = 45 minuta

Seminari

	Seminar topics	**Number of classes/hours**
1.	-adhesive cementation of esthetic intracanal posts and indirect restorations	2
2.	-application od adhesive systems	2
3.	-future of adhesive systems	3
4.	-	-
5.	-	-
6.	-	-
7.	-	-

8.	-	-
9.	-	-
10.	-	-

1 sat = 45 minuta

Vježbe

	practicals topics	**Number of classes/hours**
1.	-Experimemntal procedures for determining the efficiency of adhesive systems	3
2.	-FTIR	2
3.	-Universal instrument for testing of mechanical properties, Inspekt duo 5kN	2
4.	-	-
5.	-	-
6.	-	-
7.	-	-
8.	-	-
9.	-	-
10.	-	-

1 class = 45 minutes

Literature

TARLE Z et al. Restorative dental medicine. Zagreb: Medicinska naklada; 2021.

Foxton RM. Current perspectives on dental adhesion: (2) Concepts for operatively managing carious lesions extending into dentine using bioactive and adhesive direct restorative materials. Japanese Dental Science Review. 202;56:208-15.

TARLE Z, PAR M. Bioactive dental composite materials. Rad HAZU. 2018;533(45):83-100. DOI: 10.21857/mnlqgc02ky

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

Zrinka Tarle was born on the 28th of August 1969.

She is a full professor, permanent position in the field of restorative dentistry and endodontics at the School of Dental Medicine, University of Zagreb. Her field of expertise is based on the investigation

of properties and possible improvements of materials and procedures in restorative dental medicine. She obtained a PhD degree in 1995 with the doctoral dissertation "The evaluation of polymerization effect of pulsed laser light source in the composite resin sample".

She was the leader of the top graded project funded by the Ministry of Science "Nanostructure of restorative materials and interactions with hard dental tissues", the principal investigator of the program of Croatian Science Foundation: "Evaluation of new bioactive materials and procedure in restorative dental medicine", „Biomimetic intelligent composite materials" (active) and IADR project: Bulk versus incremental layering of composite: a practice-based, randomized, controlled, prospective clinical study: 'CED-IADR PBRN project'

She is a Dean of School of dental Medicine University of Zagreb from 2018. She was a Vice dean for Science and Research from 2007 to 2018., head of Postgraduate Doctoral Study Dental Medicine and head of Restorative dental medicine.

She was a mentor on 25 graduate theses, 2 master and 10 doctoral dissertations.

She is the author of more than 220 publications, lecturer at numerous national and international meetings and organizer of different courses, symposia and congresses.

She is a Board member of CED IADR (2008-2016, President 2013-2014), PER IADR (2014-; Treasurer 2016-), AODES (2015-2019) and a member of IADR Nominating (2015-2017, 2017-2018-Chair) and Tellers Committee (2018-2021. 2021-2021-Chair); a member of many international and national scientific associations, as well as boards and committees of University, Ministry of Science, Ministry of Health, Croatian Academy of Sciences and Arts and Croatian Science Foundation.

She got many national and international awards for her scientific work but the most important one was the National Award for Science in 2012. The biggest privilege was her choice in the Croatian Academy of Sciences and Arts.

She is married and the mother of two sons.

Bibliography:

https://www.bib.irb.hr/pretraga?operators=and|Tarle,%20Zrinka%20%2828282%29|text|profile