



## FDI DRAFT POLICY STATEMENT

### Repair of Restorations

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#### 3 **CONTEXT**

4 Defective dental restorations are frequently encountered in general dental practice.  
5 Replacement of such restorations is often costly and necessitates sacrifice of sound tooth  
6 tissues compromising the vitality of the dental pulp and potentially accelerating of the  
7 restoration cycle or premature loss of the tooth.

8 With the advances in adhesive dentistry, restoration repair has become an integral part  
9 of minimally invasive dentistry. The repair of restorations should be considered on a  
10 case-by-case basis.

11 Current surveys investigating the attitudes and experiences of dentists regarding repaired  
12 restorations indicate they are gaining increased acceptance among dental practitioners  
13 and patients <sup>1</sup>. Nevertheless, repair of restorations is not practiced frequently worldwide  
14 partly due to lack of global guidelines [2], limited information on the long term clinical  
15 outcomes [3], continuous changes in materials and technologies [4,5] and variations in  
16 dental teaching curricula worldwide as well as healthcare systems [2].

#### 17 **SCOPE**

18 The present FDI Policy Statement gives guidance on the diagnosis of defective  
19 restorations made of various direct and indirect materials using well-established quality  
20 assessment criteria based on visual, tactile and radiographic examinations and tooth- and  
21 patient-specific criteria.

22 This Policy Statement defines measures for decision making on when and how to repair  
23 and when to replace restorations.

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#### 25 **DEFINITIONS**

##### 26 **Repair:**

27 Correction of a clinically unacceptable restoration bringing it to a clinically acceptable  
28 status with a minimally-invasive approach that implies the addition of a restorative material.

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##### 30 **Refurbishment:**

31 Procedure involving removal of overhangs and irregularities, surface recontouring,

32 removal of discolouration and smoothening or glazing of surface to improve a dental  
33 restoration and delay repair.

#### 34 **Sealing:**

35 *Refurbishment* consisting of closure of superficial pores and small gaps by adding glaze  
36 or bonding and, occasionally, a new layer of sealant or flowable material.

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### 38 **PRINCIPLES**

39 Cutting sound tooth tissue always causes irreversible damage and cavity size will  
40 invariably increase when restorations are replaced, regardless of material. Repair of  
41 restorations preserves the existing tooth structure and tooth vitality, increases the longevity  
42 of the remaining restoration, may reduce chairside treatment time, may reduce the need  
43 for local anaesthesia and help mitigate the effects of dental anxiety as well as saving  
44 overall resources.

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### 46 **POLICY**

47 FDI World Dental Federation supports a shift in management of defective restorations  
48 necessitating that the required protocols for repairing defective restorations be included in  
49 undergraduate curriculum and continuing education.

50 The individual risk of the patient to develop carious lesions, the clinical condition and  
51 prognosis of the restored tooth as a unit, cost-benefit analysis, medical history and dental  
52 anxiety are critical considerations for appropriate decision-making regarding repairs.  
53 Finally, repair focuses on tooth survival. The feasibility of repair should always be  
54 discounted first and the underlying cause of failure should be identified before repair or  
55 total replacement is undertaken.

56 Refurbishment is often effective successfully to manage superficial staining and  
57 overhangs of restorations but deeper penetrations of (marginal) staining or presence of  
58 defects may require repair or total replacement to achieve acceptable aesthetic outcomes  
59 [6].

60 Repair protocols are determined by the restoration material in place and specific  
61 manufacturer instructions along with the durability of adhesion achieved on the substrate  
62 and the location in the oral cavity. An armamentarium of methods and meticulous  
63 application of chemicals may be required [4].

- 64 1. **Surface preparation:** All types of restoration surfaces to be repaired need to be  
65 cleaned first using pumice or polishing paste. Loose/cracked areas on surface  
66 should be removed and smoothed by i.e. fine-grit diamond burs.
- 67 2. **Physical conditioning:** Resin composite, amalgam, zirconia and exposed metal  
68 parts of metal-ceramic reconstructions (PFM) initially require application of physical  
69 conditioning method using air-borne particle abrasion (i.e. alumina or silica-coated  
70 alumina particles). Glassy matrix veneering ceramics could be etched with buffered  
71 hydrofluoric acid to achieve micromechanical retention (respecting precautions and  
72 national directives).

- 73 3. **Chemical conditioning:** The next step is chemical surface conditioning of the  
74 substrates using silane coupling agents for hybrid composite resins and silicate  
75 ceramics or i.e. 10-MDP-primers for zirconia. This is followed by adhesive resin  
76 application and its photo-polymerization.  
77 In cases where there are exposed metal surfaces tribochemical silicatization of the  
78 surface with silica-coated particles (cojet) followed by silanization (with silane) and  
79 adhesive is recommended.
- 80 4. Resin composite can then be adhered onto the physico-chemically conditioned  
81 surfaces as repair material which is then photo-polymerized.
- 82 5. Lastly, the repaired area is finished and polished.
- 83 6. If tooth substance is present next to the restoration to be repaired, the restoration  
84 surface should first be treated with the appropriate physical conditioning method  
85 prior to physical conditioning (etching with phosphoric acid) of the tooth surface.  
86 The chemical conditioning of the restoration with silane or 10-MDP/multiple primers  
87 and chemical conditioning of the restoration and the tooth surface with an adhesive  
88 resin should be the conditioning sequence for multiple substances.

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90 **Publication under preparation**

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111 **KEYWORDS**

112 repair, replacement, minimally invasive, minimum intervention dentistry, restorative  
113 dentistry

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116 **DISCLAIMER**

117 The information in this Policy Statement was based on the best scientific evidence  
118 available at the time. It may be interpreted to reflect prevailing cultural sensitivities and  
119 socio-economic constraints.