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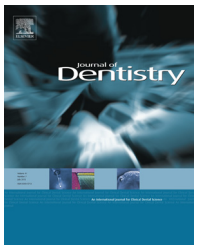

The decision to repair or replace a defective restoration is affected by who placed the original restoration: Findings from the National Dental PBRN

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ABSTRACT

Objectives: To evaluate how restoration characteristics are associated with the decision to repair or replace an existing restoration. The following hypotheses were studied: dentists who placed the original restoration are more likely to repair instead of replace restorations (H1) that are in molar teeth; (H2) that are in the upper arch; (H3) that have amalgam restorative material; (H4) if a fracture is not the primary reason for the defect; and (H5) when the restoration comprises more than one surface.

Methods: This cross-sectional study used a consecutive patient/restoration recruitment design. 194 dentists members of a dental practice-based research network recorded data on restorations in permanent teeth that needed repair or replacement.

Results: For 6623 of the 8770 defective restorations in 6643 patients, the treatment was provided by the dentist who had not placed the original restoration (75%). The 2-way interaction revealed that dentists who had placed the original restoration often chose to repair when the defective restoration was in a molar, relative to premolar or anterior teeth (OR = 2.2, $p < .001$); and chose to replace when the restoration had amalgam (OR = 0.5, $p < .001$), and when it was a fracture compared to another reason (OR = 0.8, $p = 001$).

Conclusion: Most dentists are not conservative when they revisit a restoration that they originally placed regardless of type of failure, number of surfaces or material used. However, Q3 dentists who had placed the original restoration were significantly more likely to repair it when the defective restoration was in a molar tooth.

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[1] The National Dental Practice-Based Research Network Collaborative Group includes practitioners, faculty and staff investigators who contributed to this network activity. A list of these people is available at http://nationaldentalpbrn.org/collaborative-group.php under the title ''Reasons for Replacement or Repair of Dental Restorations.''

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1. Introduction

Every day most general dentists devote a large portion of their clinical time examining existing restorations.[1–3,4] When clinicians deem a restoration defective, four main scenarios are usually encountered: (1) the restoration is fractured; (2) the margin of the restoration is ditched; (3) the margin of the restoration has caries; or (4) the margin of the restoration is stained. The diagnosis that relates to the presence of caries or staining around the margins of restorations is inconsistent among dental practitioners and it often does not rely on objective criteria.[5–7] When deciding on what treatment to provide to a defective restoration, dentists are faced with multiple treatment options, e.g., replacement, repair, sealant, polishing, or no treatment. Despite these options, most dentists decide to replace an existing restoration that deviates from the ideal, regardless of its location and longevity.[8–10] Studies have also suggested that change in the dental care provider significantly increases the odds of patients receiving new restorations.[11–14,15]

Previous clinical studies conducted in practice-based settings have also indicated that restorations involving multiple surfaces have lower longevity than restorations with a single surface.[16] Tooth type also seems to have an effect on restoration longevity, with molars demonstrating lower long-term success rates than anterior teeth.[17]

Based on a previous study, we have already established that dentists who placed the original restoration are more likely to repair than replace an existing restoration, compared to a dentist who is not the one who placed the defective restoration.[18] The aim of this secondary analysis was to evaluate how restoration characteristics are significantly associated with the decision to repair or replace an existing restoration, as a function of who placed the original restoration. The following hypotheses were studied: dentists who placed the original restoration are more likely to repair instead of replace restorations (H1) that are in molar teeth; (H2) that are in the upper arch; (H3) that have amalgam restorative material; (H4) if a fracture is not the primary reason for the defect; and (H5) when the restoration comprises more than one surface.

2. Method

2.1. Selection and recruitment process

This cross-sectional study included 194 dentists of the National Dental Practice-Based Research Network (the ''network''), a consortium of dental practices and dental organizations focused on improving the scientific basis for clinical decision making.[19] The network was funded in 2012 and builds on the former regional dental networks, including the Dental Practice-Based Research Network (DPBRN), that existed from 2003 to 2012.[20] The DPBRN was established in 2003 with a seven-year grant from the National Institute of Dental and Craniofacial Research National Institutes of Health. The data for this study were collected under the auspices of the DPBRN from 2008 to 2009. That organization subsequently evolved into The National Dental PBRN, under the aegis of which we prepared the manuscript of this article.

At the time of this study, the network was composed primarily of clinicians from five regions: Alabama/Mississippi; Florida/Georgia; dentists in Minnesota, either employed by HealthPartners in Bloomington, Minn., or in private practice; Permanente Dental Associates, in cooperation with Kaiser Permanente's Center for Health Research in Portland, Ore.; and dentists from Denmark, Norway and Sweden. Each of the 194 participating dentists recorded data for 50 or more consecutive restorations deemed defective during clinical visits. Practice structures differed by network region. Dentists from the AL/MS and FL/GA regions were primarily from solo or small group practices, MN and PDA dentists were primarily from large group practices, and SK dentists were in public or private health care settings. The Institutional Review Boards of each participating region approved the study. Network dentists were recruited through continuing education courses and/or mass mailings to licensed dentists within the participating regions. As part of the eligibility criteria, all dentists completed (1) an enrollment questionnaire describing their demographic and practice characteristics and certain personal characteristics, (2) an assessment of caries diagnosis and caries treatment questionnaire, (3) a training in human subjects protection, and (4) a in-practice network orientation session with the regional coordinator. Additional requirements varied by network region and are described elsewhere.[21] Copies of the questionnaires and summary data for dentists' demographic and practice characteristics are also available at http://www.dpbrn.org/users/publications/Default.aspx and elsewhere.[22,23]

This study used a consecutive patient/restoration recruitment design. Once the study was started, every patient scheduled to have a repair or replacement of a restoration on a permanent tooth was asked to participate until 50 restorations were enrolled. Patients who returned for additional appointments while data collection was still ongoing were not eligible for further data collection. In order to increase the numbers of patients only restorations eligible during the first appointment were enrolled and only a maximum of four eligible restorations per patient during that first appointment were included. A consecutive patient/restoration log form was used to record information on eligible restorations whether or not the patient participated in the study. All the data collection forms used for this study are available at http://www.DentalPBRN.org/users/publications/Supplement.aspx.

2.2. Variable selection

Replacement of the restoration was characterized as the removal of the defective original restoration and any adjacent pathologically altered and discoloured tooth tissue that was aesthetically unacceptable. Repair was characterized as the conservative removal of part of the defective original restoration and any adjacent pathologically and/or discoloured enamel/dentine tissues that were aesthetically unacceptable followed by placement of restorative material. Repair also included light grinding and polishing; removal of overhangs, polishing discoloured tooth-coloured restorations, or sealing margins. Functioning restorations that had not failed but were

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