Clinical performance of glass ionomer cement and composite resin in Class II restorations in primary teeth: A systematic review and meta-analysis. [Review]

OBJECTIVES: This study compared the clinical performance of glass ionomer cement (GIC) compared to composite resin (CR) in Class II restorations in primary teeth.

DATA: Literature search according to PRISMA guidelines including randomized controlled trials comparing Class II restorations performed with GIC, compared to CR, in primary teeth.

CONCLUSIONS: GIC and CR presented similar clinical performance for all criteria analyzed, except for secondary carious lesions, in which GIC presented superior performance, especially for the resin-modified GIC and with rubber dam isolation.
OBJECTIVES: The purpose of this systematic review was to compare the clinical performance of bulk-fill resin composites with conventional resin composites used for direct restorations of posterior teeth.

METHODS: This review followed the PRISMA statement. This review was registered at PROSPERO (registration number CRD42016053436). A search of the scientific literature was performed by two independent reviewers using the PubMed/MEDLINE, Embase, The Cochrane Library, and Web of Science databases from commencement until January 2018. The research question was "Do bulk-fill resin composites have a clinical performance comparable to conventional resin composites in posterior restorations?" Only studies evaluating class I and II direct restorations in permanent teeth with a follow-up period of at least 1 year were included. The RevMan 5 program was used for meta-analysis, calculating the relative risk (RR) and 95% confidence interval (CI) of the dichotomous outcome (restoration failure or success).

RESULTS: Ten articles were selected, comprising 941 analyzed restorations. The mean follow-up period was 33.6 months (12-72 months). No statistically significant differences in the failure rate were observed between conventional and base/flowable bulk-fill resin composites (p=0.31; RR 1.49; 95% CI 0.69-3.25) or full-body/sculptable bulk-fill resin composites (p =0.12; RR 1.89; 95% CI 0.84-4.24).

CONCLUSIONS: The present systematic review and meta-analysis indicate similar clinical performances of bulk-fill and conventional resin composites over a follow-up period of 12 to 72 months.

CLINICAL SIGNIFICANCE: Based on the results of this study, the bulk-fill resin composites could be an alternative for direct restorations in posterior teeth. However, clinical trials of longer duration are required.
Do Nanofilled/Nanohybrid Composites Allow for Better Clinical Performance of Direct Restorations Than Traditional Microhybrid Composites? A Systematic Review.

This systematic review was carried out to assess the clinical effectiveness of nanofilled and nanohybrid composites used for direct restorations in comparison with microhybrid composites. The guidelines for the preferred reporting items for systematic reviews and meta-analyses were followed. A search of articles published from July 1996 to February 2017 was performed in PubMed, Scopus, Latin American and Caribbean Health Sciences, the Scientific Electronic Library Online, and the Cochrane Library. The present review selected only randomized controlled trials comparing the clinical performance of a nanofilled or nanohybrid composite for direct restorations with that of a microhybrid composite. The research found 201 studies. Twenty-one articles fulfilled the criteria of the present review. However, the included studies were characterized by great methodological diversities. As a general trend, nanofilled and nanohybrid composites were found to be capable of clinical performance, marginal quality, and resistance to wear similar to that of traditional composites without showing improved surface characteristics. The risk of bias of included studies was judged unclear or high. The clinical performance of nanofilled/nanohybrid composites was found to be comparable to that of traditional composites in the posterior area. The data concerning anterior and cervical restorations were insufficient. With regard to the aesthetic properties, there is a compelling need for studies on anterior teeth in which the operators are kept unaware of the restorative material. Nanofilled/nanohybrid composites seem to be a valid alternative to traditional microhybrid composites, and at the moment, there is low-level evidence attesting a lack of their superiority.
Restorative Treatment in Patients with Amelogenesis Imperfecta: A Review. [Review]

METHODS: An electronic literature search was conducted using the search term "Amelogenesis imperfecta" and the PubMed/MEDLINE database as well as Google Scholar. Prospective and retrospective clinical studies that investigated the outcome of direct and/or indirect dental restorative treatment in patients with AI, were published in English, and had an observation time of at least 1 year were included in this review. The articles identified were screened and analyzed by two reviewers according to inclusion and exclusion criteria in three review rounds.

RESULTS: Six prospective or retrospective clinical studies analyzing longevity and complications associated with dental restorative treatment in patients with AI met the inclusion criteria. Extracted data suggest that in patients with AI, indirect restorations feature superior predictability and longevity than direct restorations.

CONCLUSIONS: As endodontic complications were infrequently observed and periodontal parameters regularly improve with the insertion of indirect restorations, dental treatment in patients with AI should focus on indirect restorations as soon as possible. While adhesive bonding techniques to enamel surfaces in patients with AI feature merely limited predictability and longevity and as the available data is scarce, further laboratory and clinical studies should be performed to investigate the performance of minimally invasive indirect restorations bonded to enamel in patients with AI.

RECOMMENDATION: Scientific evidence indicates that indirect restorations should be preferred over direct restorations in patients with AI.

Marginal adaptation and CAD-CAM technology: A systematic review of restorative material and fabrication techniques. [Review]

STATEMENT OF PROBLEM: The comparative assessment of computer-aided design and computer-aided manufacturing (CAD-CAM) technology and other fabrication techniques pertaining to marginal adaptation should be documented. Limited evidence exists on the effect of restorative material on the performance of a CAD-CAM system relative to marginal adaptation.

PURPOSE: The purpose of this systematic review was to investigate whether the marginal adaptation of CAD-CAM single crowns, fixed dental prostheses, and implant-retained fixed dental prostheses or their infrastructures differs from that obtained by other fabrication techniques using a similar restorative material and whether it depends on the type of restorative material.
RESULTS: Of the 55 included comparative studies, 28 compared CAD-CAM technology with conventional fabrication techniques, 12 contrasted CAD-CAM technology and copy milling, 4 compared CAD-CAM milling with direct metal laser sintering (DMLS), and 22 investigated the performance of a CAD-CAM system regarding marginal adaptation in restorations/infrastructures produced with different restorative materials.

CONCLUSIONS: Most of the CAD-CAM restorations/infrastructures were within the clinically acceptable marginal discrepancy (MD) range. The performance of a CAD-CAM system relative to marginal adaptation is influenced by the restorative material. Compared with CAD-CAM, most of the heat-pressed lithium disilicate crowns displayed equal or smaller MD values. Slip-casting crowns exhibited similar or better marginal accuracy than those fabricated with CAD-CAM. Cobalt-chromium and titanium implant infrastructures produced using a CAD-CAM system elicited smaller MD values than zirconia. The majority of cobalt-chromium restorations/infrastructures produced by DMLS displayed better marginal accuracy than those fabricated with the casting technique. Compared with copy milling, the majority of zirconia restorations/infrastructures produced by CAD-CAM milling exhibited better marginal adaptation. No clear conclusions can be drawn about the superiority of CAD-CAM milling over the casting technique and DMLS regarding marginal adaptation.

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RECENT REVIEWS RELATED TO RESTORATIVE DENTISTRY

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Authors
Louwerens JWK.
Authors Full Name
Louwerens, J W K.
Institution
Louwerens, J W K. Foot and Ankle Reconstruction Unit, St Maartenskliniek, Postbox 9011, 6500 GM, Nijmegen, The Netherlands. j.louwerens@maartenskliniek.nl.
Title
Operative treatment algorithm for foot deformities in Charcot-Marie-Tooth disease. [Review]
Source
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Abstract
The present article presents a short summary concerning the pathomechanisms and clinical presentation of foot deformities in Charcot-Marie-Tooth syndrome. Furthermore, a classification system is introduced and based on a recently performed review of the literature an operative treatment algorithm is provided. The operative techniques of the following surgical procedures is described in more detail: 1. dorsiflexion osteotomy at the base of the 1st metatarsus, 2. dorsiflexion osteotomy at the base of a lesser metatarsal bone, 3. claw hallux correction including fusion of the first phalangeal joint, 4. claw toe correction, 5. transfer of extensor digitorum longus tendons to the peroneal tendons and finally 6. tibialis posterior tendon transfer to the dorsiflexors of the foot.

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Authors
Azeem RA; Sureshbabu NM.
Authors Full Name
Azeem, Rubeena Abdul; Sureshbabu, Nivedhitha Malli.
Institution
Azeem, Rubeena Abdul. Department of Conservative Dentistry and Endodontics, Saveetha Dental College, Saveetha University, Chennai, Tamil Nadu, India.
Sureshbabu, Nivedhitha Malli. Department of Conservative Dentistry and Endodontics, Saveetha Dental College, Saveetha University, Chennai, Tamil Nadu, India.
Title
Clinical performance of direct versus indirect composite restorations in posterior teeth: A systematic review. [Review]
Source
Abstract
Background: Composite resin, serves as esthetic alternative to amalgam and cast restorations. Posterior teeth can be restored using direct or indirect composite restorations. The selection between direct and indirect technique is a clinically challenging decision-making process. Most important influencing factor is the amount of remaining tooth substance.

Aim: The aim of this systematic review was to compare the clinical performance of direct versus indirect composite restorations in posterior teeth.

Materials and Methods: The databases searched included PubMed CENTRAL (until July 2015), Medline, and Cochrane Database of Systematic Reviews. The bibliographies of clinical studies and reviews identified in the electronic search were analyzed to identify studies which were published outside the electronically searched journals. The primary outcome measure was evaluation of the survival of direct and indirect composite restorations in posterior teeth.

Results: This review included thirteen studies in which clinical performance of various types of direct and indirect composite restorations in posterior teeth were compared. Out of the thirteen studies which were included seven studies had a high risk of bias and five studies had a moderate risk of bias. One study having a low risk of bias, concluded that there was no significant difference between direct and indirect technique. However, the available evidence revealed inconclusive results.

Conclusion: Further research should focus on randomized controlled trials with long term follow-up to give concrete evidence on the clinical performce of direct and indirect composite restorations.

Publication Type
Association of sleep bruxism with ceramic restoration failure: A systematic review and meta-analysis. [Review]

EVALUATION: The purpose of this systematic review and meta-analysis was to assess whether the presence of SB is associated with increased ceramic restoration failure.

MATERIAL AND METHODS: Observational studies and clinical trials that evaluated the short- and long-term survival rate of ceramic restorations in SB participants were selected. Sleep bruxism diagnostic criteria must have included at least 1 of the following: questionnaire, clinical evaluation, or polysomnography. Seven databases, in addition to 3 non-peer-reviewed literature databases, were searched. The risk of bias was assessed by using the meta-analysis of statistics assessment and review instrument (MASTARI) checklist.

RESULTS: Eight studies were included for qualitative synthesis, but only 5 for the meta-analysis. Three studies were categorized as moderate risk and 5 as high risk of bias. Clinical and methodological heterogeneity across studies were considered high. Increased hazard ratio (HR=7.74; 95% confidence interval [CI]=2.50 to 23.95) and odds ratio (OR=2.52; 95% CI=1.24 to 5.12) were observed considering only anterior ceramic veneers. Nevertheless, limited data from the meta-analysis and from the restricted number of included studies suggested that differences in the overall odds of failure concerning SB and other types of ceramic restorations did not favor or disfavor any association (OR=1.10; 95% CI=0.43 to 2.8). The overall quality of evidence was considered very low according to the GRADE criteria.

CONCLUSIONS: Within the limitations of this systematic review, the overall result from the meta-analysis did not favor any association between SB and increased risk of failure for ceramic restorations.
POSTENDODONTIC RESTORATION: ENDODONTIC POST-AND-CORE OR NO POST AT ALL?

Naumann M; Schmitter M; Krastl G.

Authors Full Name
Naumann, Michael; Schmitter, Marc; Krastl, Gabriel.

Title
Postendodontic Restoration: Endodontic Post-and-Core or No Post At All?

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Abstract
PURPOSE: The objective of this systematic review was to assess the impact of endodontic post insertion on the clinical performance of endodontically treated teeth (ETT).

MATERIALS AND METHODS: A specific PICO question was developed and a Medline search was performed in January 2017 using relevant terms in order to identify studies comparing the success/survival of dental restorations using endodontic posts or no posts. Additionally, the electronic databases "OpenGrey", "BBDO", "LILAC" and "IBECS" were assessed and a hand search of cross references from original articles and reviews was performed. The methodological quality of the included studies was assessed independently by three referees using (1) the critical appraisal skills program (CASP) and (2) Cochrane checklist (version 5.1.0).

RESULTS: A total of 14 studies were included, among them 11 randomized controlled trials (RCT), two prospective clinical trials, and one retrospective clinical trial. The overall quality of the studies was good according to the CASP. However, the Cochrane rating showed that in seven studies, the risk of bias was high in >40% of the items, indicating a relevant level of methodological flaws. Three studies showed a low risk of bias in >80% of the items. The majority (10 out of 14) of the clinical studies included failed to show a positive effect of post placement. A post effect is possible when no cavity wall is present.

CONCLUSION: There is no unequivocal clinical evidence to support or reject the use of posts even for no-wall cavities, either for direct or indirect restorations.

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COLOR IN ZIRCONIA-BASED RESTORATIONS AND RELATED FACTORS: A LITERATURE REVIEW

Tabatabaian F.

Authors Full Name
Tabatabaian, Farhad.

Institution
Tabatabaian, Farhad. Department of Prosthodontics, School of Dentistry, Shahid Beheshti University of Medical Sciences, Tehran, Iran.

Title
Color in Zirconia-Based Restorations and Related Factors: A Literature Review. [Review]

Source

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Abstract
Zirconia ceramic is a popular trend in esthetic and restorative dentistry. Computer-aided design/computer-aided manufacturing (CAD/CAM) systems have been well developed to fabricate zirconia frameworks and restorations with acceptable mechanical properties. Zirconia ceramics have excellent optical characteristics; however, achieving optimal esthetic outcomes with zirconia-based restorations is still challenging due to multiple effective factors on the final color. These factors are different layers of a zirconia-based restoration and its underlying structures including: dental substrate, cement, zirconia coping, veneering ceramic, and glaze. Moreover, the laboratory procedure of these restorations' fabrication is another effective factor on the resultant color. Unpredictable esthetic results may be obtained without estimation of the role of each factor and its effect on the final color. This review discussed the color aspect of zirconia-based restorations according to these factors and based on the literature. In the past decade, investigators have been concerned with the shade reproduction with zirconia-based restorations; however, there are no sufficient clinical guidelines on how to reproduce the appearance of natural teeth with these restorations. Zirconia-based restorations have presented a new chance for accomplishing optimum esthetics. Nonetheless further investigations are needed on these restorations to establish clinical guidelines on esthetics.
Background: Several restorative materials with specific indications are used for filling cavities in primary teeth.

Aim: To systematically review the literature in order to investigate the longevity of primary teeth restorations and the reasons for failure.

Design: Electronic databases were screened, and eligible studies were hand-searched to find longitudinal clinical studies evaluating the survival of restorations (class I, class II, and crown) placed with different materials in primary teeth with at least one year of follow-up.

Results: Thirty-one studies were included, and a high bias risk was observed. Overall, 12,047 restorations were evaluated with 12.5% of failure rate. A high variation on annual failure rate (AFR) was detected (0-29.9%). Composite resin showed the lowest AFRs (1.7-12.9%). Stainless steel crowns (SSC) had the highest success rate (96.1%). Class I restorations and restorations placed using rubber dam presented better AFR. The main reason for failure observed was secondary caries (36.5%).

Conclusions: An elevated number of failures were observed due to recurrent caries, highlighting the need for professionals to work with a health-promoting approach. The high variation on failure rate among the materials can be due to children's behavior during the procedure, which demands short dental appointments and a controlled environment.
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RECENT REVIEWS RELATED TO RESTORATIVE DENTISTRY

Title
Understanding the management and teaching of dental restoration repair: Systematic review and meta-analysis of surveys. [Review]
Source

Abstract
OBJECTIVES: Repair instead of complete replacement is recommended to manage partially defective restorations. It is unclear if and why such treatment is taught at dental schools or practiced by dentists. We aimed to identify barriers and facilitators for repairs using a systematic review and meta- and qualitative analysis.

SOURCES: Electronic databases (PubMed, CENTRAL, Embase, PsycINFO) were searched.

STUDY SELECTION: Quantitative studies reporting on the proportion of (1) dentists stating to perform repairs, (2) dental schools teaching repairs, (3) failed restorations having been repaired were included. We also included qualitative studies on barriers/facilitators for repairs. Random-effects meta-analyses, meta-regression and a thematic analysis using the theoretical domains framework were conducted.

DATA: 401 articles were assessed and 29, mainly quantitative, studies included. 7228 dentists and 276 dental schools had been surveyed, and treatment data of 30,172 restorations evaluated. The mean (95% CI) proportion of dentists stating to perform repairs was 71.5% (49.7-86.4%). 83.3% (73.6-90.0%) of dental schools taught repairs. 31.3% (26.3-36.7%) of failed restorations had been repaired. More recent studies reported significantly more dentists to repair restorations (p=0.004). Employment in public health practices and being the dentist who placed the original restoration were facilitators for repairs. Amalgam restorations were repaired less often, and financial aspects and regulations came as barriers.

CONCLUSIONS: While most dentists state to perform repairs and the vast majority of dental schools teach repairs, the proportion of truly repaired restorations was low. A number of interventions to implement repair in dental practice can be deduced from our findings.

CLINICAL SIGNIFICANCE: Partially defective restorations are common in dental practice. While repairs are taught and dentists are aware of the recommendation towards repairs, the actually performed proportion of repairs seems low.

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Authors
Zarow, M; Ramirez-Sebastia A; Paolone G; de Ribot Porta J; Mora J; Espona J; Duran-Sindreu F; Roig M.

Institution
Zarow, M. Private Practice, Krakow, Poland.
Ramirez-Sebastia, A. Department of Restorative Dentistry and Endodontics, School of Dentistry, Universitat Internacional de Catalunya, Barcelona, Spain.
Paolone, G. Dental School, Universita Vita e Salute San Raffaele, Milan, Italy.
de Ribot Porta, J. Department of Restorative Dentistry and Endodontics, School of Dentistry, Universitat Internacional de Catalunya, Barcelona, Spain.
Mora, J. Department of Restorative Dentistry and Endodontics, School of Dentistry, Universitat Internacional de Catalunya, Barcelona, Spain.
Espona, J. Department of Restorative Dentistry and Endodontics, School of Dentistry, Universitat Internacional de Catalunya, Barcelona, Spain.
Duran-Sindreu, F. Department of Restorative Dentistry and Endodontics, School of Dentistry, Universitat Internacional de Catalunya, Barcelona, Spain.
Roig, M. Department of Restorative Dentistry and Endodontics, School of Dentistry, Universitat Internacional de Catalunya, Barcelona, Spain.

Title
A new classification system for the restoration of root filled teeth. [Review]
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Abstract
The aim of this report is to (i) review the current literature on the status of root filled teeth, (ii) analyse the most important factors in decision-making, (iii) discuss the current restorative concepts, and (iv) classify both the evidence and clinical practice in a way that seeks to be clear, understandable and helpful for clinicians. Restoration of root filled teeth represents a challenge for the clinician and remains a controversial subject. The guidelines describe a new classification that is drawn from evidence presented in the literature and also from clinical expertise-based reviews. It describes five categories of teeth.

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Authors
Nagarkar SR; Perdigao J; Seong WJ; Theis-Mahon N.
Authors Full Name
Nagarkar, Sanket R; Perdigao, Jorge; Seong, Wook-Jin; Theis-Mahon, Nicole.
Title
Digital versus conventional impressions for full-coverage restorations: A systematic review and meta-analysis. [Review]
Source

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Abstract
BACKGROUND: The primary objective of this systematic review was to investigate the survival of full-coverage restorations fabricated by using digital impressions (DIs) versus that of those fabricated by using conventional impressions. The authors also compared secondary outcomes of marginal and internal fit and occlusal and interproximal contacts.

TYPES OF STUDIES REVIEWED: The authors conducted a systematic literature search in multiple databases to identify clinical trials with no restrictions by publication type, date, or language. The authors assessed study-level risk of bias and outcome-strength of evidence. The authors performed a meta-analysis by using a random-effects model.

RESULTS: Ten studies met the inclusion criteria. The authors identified no studies in which the investigators compared the impression techniques with respect to survival of full-coverage restorations. Mean differences for marginal gap and internal gap were -9.0 micrometers (95% confidence interval, -18.9 to 0.9) and -15.6 mum (95% confidence interval, -42.6 to 11.4), respectively. Studies assessing internal gap were substantially heterogeneous ($I^2 = 72%; P = .003$).

CONCLUSIONS AND PRACTICAL IMPLICATIONS: Research is lacking to draw robust conclusions about the relative benefits of DIs in terms of restoration survival. Low-quality evidence for marginal fit and internal fit suggested similar performance for both techniques. Evidence quality for interproximal contact and occlusal contact was very low and insufficient to draw any conclusions regarding how the impression techniques compared. Given the uncertainty of the evidence, results should be interpreted with caution. With increasing popularity and adoption of digital scanners by dentists, pragmatic practice-based trials involving standardized, patient-centered outcomes may improve confidence in the comparative effectiveness of DIs.

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Authors
Schwendicke F; Opdam N.
Authors Full Name
Schwendicke, Falk; Opdam, Niek.
Institution
Schwendicke, Falk. Department of Operative and Preventive Dentistry, Charite - Universitätsmedizin Berlin, Asmannshauser Str. 4-6, 14199 Berlin, Germany. Electronic address: falk.schwendicke@charite.de.
validity and accuracy in results. We describe our experience with some testing methodologies for CAD/CAM materials and discuss the theoretical background, oftentimes overlooked in the dental community.

Abstract

BACKGROUND: An important tool in materials research, development and characterization regarding mechanical performance is the testing of fracture toughness. A high level of accuracy in executing this sort of test is necessary, with strict requirements given in extensive testing standard documents. Proficiency in quality specimen fabrication and test requires practice and a solid theoretical background, oftentimes overlooked in the dental community.

AIMS: In this review we go through some fundamentals of the fracture mechanics concepts that are relevant to the understanding of fracture toughness testing, and draw attention to critical aspects of practical nature that must be fulfilled for validity and accuracy in results. We describe our experience with some testing methodologies for CAD/CAM materials and discuss
advantages and shortcomings of different tests in terms of errors in testing the applicability of the concept of fracture toughness as a single-value material-specific property.

PERSPECTIVE: The purpose of the present systematic review was to assess information on the mechanical, chemical, and optical requirements of monolithic zirconia dental restorations.

MATERIAL AND METHODS: The following databases (2010 to 2015) were electronically searched: ProQuest, EMBASE, SciFinder, MRS Online Proceedings Library, Medline, Compendex, and Journal of the American Ceramic Society. The search was limited to English-language publications, in vitro studies, experimental reports, and modeling studies.

RESULTS: The data from 57 studies were considered in order to review the intrinsic and extrinsic characteristics of zirconia and their effects on the optical properties.

CONCLUSIONS: The materials and microstructural issues relevant to the esthetics and long-term stability of zirconia have been considered in terms of monolithic restorations, while there also are restorations specifically for esthetic applications. Although zirconia-toughened lithium silicate offers the best esthetic outcomes, transformation-toughened zirconia offers the best mechanical properties and long-term stability; cubic stabilized zirconia offers a potential compromise. The properties of these materials can be altered to some extent through the appropriate application of intrinsic (such as, annealing) and extrinsic (such as, shade-matching) parameters.

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Clinical studies in restorative dentistry: New directions and new demands. [Review]

Institution
Opdam, N J M. Radboud University Medical Centre, College of Dental Sciences, P.O. Box 9101, NL 6500 HB Nijmegen, The Netherlands. Electronic address: Niek.opdam@radboudumc.nl.

Collares, K. Graduate Program in Dentistry, Federal University of Pelotas, Goncalves Chaves, 457, 96015560 Pelotas, Brazil.

Lynch, C. D. Cork University Dental School & Hospital, University College Cork, College Road, Cork T12 YN60, Ireland.

Correa, M B. Graduate Program in Dentistry, Federal University of Pelotas, Goncalves Chaves, 457, 96015560 Pelotas, Brazil.

Demarco, F. Graduate Program in Dentistry, Federal University of Pelotas, Goncalves Chaves, 457, 96015560 Pelotas, Brazil.

Schwendicke, F. Abteilung fur Zahnerrhaltung und Praventivzahnmedizin, Charite - Universitatsmedizin Berlin, Asmannshauer Str. 4-6, 14197 Berlin, Germany.

Wilson, N H F. King's College London Dental Institute, King's College London, SE19RT London, UK.

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Abstract
Clinical research of restorative materials is confounded by problems of study designs, length of trials, type of information collected, and costs for trials, despite increasing numbers and considerable development of trials during the past 50 years. This opinion paper aims to discuss advantages and disadvantages of different study designs and outcomes for evaluating survival of dental restorations and to make recommendations for future study designs. Advantages and disadvantages of randomized trials, prospective and retrospective longitudinal studies, practice-based, pragmatic and cohort studies are addressed and discussed. The recommendations of the paper are that clinical trials should have rational control groups, include confounders such as patient risk factors in the data and analysis and should use outcome parameters relevant for profession and patients.

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Title
Clinical studies in restorative dentistry: New directions and new demands. [Review]
Abstract

Some conclusions could be drawn: the impact of roughness on bacterial adhesion seems to be related not to a roughness threshold (as previously believed) but rather to a range, the range of surface roughness among different polishing methods is wide and material dependent, finishing invariably creates a rougher surface and should always be followed by a polishing method, each dental material requires its own treatment modality to obtain and maintain as smooth a surface as possible, and in vitro designs do not seem to be powerful tools to draw relevant conclusions, so in vivo and in situ designs become strongly recommended.

Title


Source


PURPOSE: To compare prosthesis and implant failures and marginal bone loss (MBL) resulting from submerged vs nonsubmerged dental implant protocols.

MATERIALS AND METHODS: Electronic and manual searches of two databases (MEDLINE [PubMed] and Cochrane) were conducted to identify randomized controlled trials (RCTs) comparing submerged to nonsubmerged dental implant protocols. Data were independently extracted by two reviewers, and meta-analyses were performed for the included RCTs. The Cochrane Risk of Bias tool was used to assess the quality of included studies.

RESULTS: Eight RCTs were identified, and six were included. Four of the included studies were considered to be at high risk of bias, one at unclear risk, and one at low risk. The meta-analysis for studies reporting MBL revealed significantly more bone loss around submerged implants ($I^2 = 0\%$, $P = .04$; mean difference: $0.12$; $95\%$ confidence interval: $0.00$, $0.24$); however, there were no differences in implant or prosthesis failures between the two interventions.

CONCLUSION: Two conclusions were made: (1) There were no differences between the two interventions regarding implant or prosthesis failures, and (2) submerged implants exhibited statistically significantly more MBL, but this difference was not clinically relevant. These conclusions should be interpreted with caution, since the present review is underpowered and the included RCTs were considered to be at high risk of bias.

Is there a best conventional material for restoring posterior primary teeth? A network meta-analysis. [Review]

This study aimed to compare the longevity of different conventional restorative materials placed in posterior primary teeth. This systematic review was conducted following the PRISMA statement and registered in PROSPERO (CRD42016035775). A comprehensive electronic search without date or language restrictions was performed in PubMed/MEDLINE, Cochrane Central Register of Controlled Trials, Scopus, Turning Research Into Practice (TRIP) and Clinical Trials databases up to January 2017, selecting randomized clinical trials that assessed the longevity of at least two different conventional restorative materials.
performed in primary molars. Seventeen studies were included in this systematic review. Pairwise and network meta-analyses were performed and relative risks and 95% confidence intervals (CI) calculated. Two reviewers independently selected the studies, extracted the data, and assessed the risk of bias. Restorations of primary molars with conventional glass ionomer cement showed increased risk of failure than compomer, resin-modified glass ionomer cement, amalgam, and composite resin. Risk of bias was low in most studies (45.38% of all items across studies). Pediatric dentists should avoid conventional glass ionomer cement for restoring primary molars.

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**Authors**
- Kruly PC; Giannini M; Pascotto RC; Tokubo LM; Suga USG; Marques ACR; Terada RSS.

**Author NameID**
- Marques, Any de Castro Ruiz; ORCID: https://orcid.org/0000-0003-1344-9870

**Authors Full Name**
- Kruly, Paula de Castro; Giannini, Marcelo; Pascotto, Renata Correa; Tokubo, Laise Midori; Suga, Uhana Seifert Guimaraes; Marques, Any de Castro Ruiz; Terada, Raquel Sano Suga.

**Institution**
- Kruly PC; Giannini M; Pascotto RC; Tokubo LM; Suga USG; Marques ACR; Terada RSS.

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- Meta-analysis of the clinical behavior of posterior direct resin restorations: Low polymerization shrinkage resin in comparison to methacrylate composite resin.

**Source**

**Abstract**
- Polymerization shrinkage of resin composite can compromise the longevity of restorations. To minimize this problem, the monomeric composition of composites have been modified. The objective of this study was to conduct a meta-analysis to assess the clinical behavior of restorations performed with low polymerization shrinkage resin composite in comparison to traditional methacrylates-based resin composite. This systematic review was registered at Prospero data system (CRD42015023940).

**Studies searched in the electronic databases PubMed, Web of Science, Scopus, Lilacs and EMBASE according to a predefined search strategy. The inclusion criteria were as follow: (1) randomized controlled clinical trials with at least six months of follow-up; (2) studies investigating composites with monomers designed to reduce polymerization shrinkage; (3) studies conducted with class I or II restorations in the permanent dentition; and (4) studies that assessed at least one of the following criteria: marginal integrity/adaptation, marginal discoloration, recurrent caries, retention of composite restorations, and postoperative sensitivity. Two independent reviewers analyzed the articles to determine inclusion and risk of bias. The search conducted in the databases resulted in a total of 14,217 studies. After reviewing the references and citations, 21 articles remained. The longest clinical follow-up time was 60 months. The meta-analysis of the data in the included studies demonstrated that only one variable (marginal adaptation after 12 months) showed statistically significant outcomes, in which methacrylates-based composites presented significantly better results than resin composites containing modified monomers. The good level of the scientific evidence as well as the overall low risk of bias of the included studies indicate that composites with silorane, ormocer or bulk-fill type modified monomers have a clinical performance similar to conventional resin composites.

**Publication Type**

**Year of Publication**
- 2018
Cervical margin relocation in indirect adhesive restorations: A literature review. [Review]

PURPOSE: The aim of this review was to summarize the existing scientific literature investigating on cervical margin relocation technique (CMR) performed prior to the adhesive cementation of the indirect restorations.

STUDY SELECTION: An electronic search with no date restriction was conducted in the MEDLINE database, accessed through PubMed. The following main keywords were used: “cervical margin relocation”, “coronal margin relocation”, “deep margin elevation” and “proximal box elevation”.

RESULTS: Seven in vitro studies and 5 clinical reports investigating on CMR are taken into consideration for the present review. The most frequently investigated parameter in almost all of the in vitro studies was the marginal adaptation of the indirect restorations. One study additionally assessed the influence of CMR on the fracture behavior of the restored teeth and one study assessed the bond strength of the indirect composite restoration to the proximal box floor. Clinical reports provided documentation with a detailed description of the treatment protocol. In the current literature no randomized controlled clinical trials or prospective or retrospective clinical studies on CMR technique could be found.

CONCLUSIONS: On the basis of the reviewed literature, it can be concluded that currently there is no strong scientific evidence that could either support or discourage the use of CMR technique prior to restoration of deep subgingival defects with indirect adhesive restorations. Randomized controlled clinical trials are necessary to provide the reliable evidence on the influence of CMR technique on the clinical performance, especially on the longevity of the restorations and the periodontal health.
Purpose: To analyze the clinical success of direct light-activated composite resin restorations in posterior teeth. The quality of the margins and occlusal surfaces were evaluated, as well as their survival, according to their extensions and locations. The clinical performance of posterior composite resin restorations with different compositions were compared. All restorations were performed by the first author in his private practice, in a 5- to 20-year period.

Materials and Methods: Several types of composite resins, provided by different manufacturers, were placed in posterior teeth, after isolation with rubber dams. To be included in the study, the restorations had to have been in function for at least 5 years and had to have been placed between October 1993 and October 2008 by the first author. The established failure criteria were: tooth and/or restoration fracture, secondary caries, endodontic treatment, or tooth loss. Included patients must have been treated in the first author's office for at least 7 years and still in the practice through 2013; all patients had complete dental arches. Patients with removable dental prostheses or disabilities, who had moved, or who had died were excluded. Of 210 patients who fulfilled the inclusion criteria, 138 randomly selected subjects were clinically examined between November 2013 and April 2014. Of these 138 patients, 61 had received 105 direct-light-activated composite resin restorations in posterior teeth, which met the inclusion criteria. Twenty-nine patients (47.5%) underwent annual maintenance therapy. The patient-based data collected from clinical exams and personal records were recorded on a specially designed form. Age, gender, period of clinical attendance, tooth preparation, location, size, quality and longevity of the restorations, restorative materials, adhesive systems, parafunctional habits, secondary caries, and maintenance therapy were the variables evaluated. Authors were blinded to the clinical assessments. Cohen’s Kappa coefficient of the quality analysis of the margins and occlusal surfaces of the restorations ranged from 0.78 to 1. Data processing was performed using Epidat software, v3.1, developed by the Conselleria de Sanidade de la Xunta de Galicia with the support of PAHO-WHO and SPSS software v13.0. If the number of complete values was too small, a Kaplan-Meier curve could not be used. Therefore the Fisher's exact test, Chi-square test, Kruskal-Wallis test, and Mann-Whitney non-parametric test were indicated to analyze significant differences.

Results: At the time of the examinations, 103 (98%) restorations were in function, and 98 (95.1%) were rated as clinically successful. Two restorations failed (2%). The observed mean survival time of restorations that remained functional was 11 years and 7 months.

Conclusions: In the present report, direct light-activated composite resin restorations in posterior teeth showed a high clinical success rate and long-term mean survival time. These composite resins might be considered the material of choice to restore medium, extended, and in some clinical situations, large preparations in posterior teeth.

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Incremental techniques in direct composite restoration. [Review]
Source
Abstract
Polymerization shrinkage is one of the dental clinician's main entanglements when placing resin-based composite restorations. None of the method can assure a perfectly sealed restoration for adhesive restorative materials; clinicians must abode problems of polymerization shrinkage and its possible ill effects. The objective of this article is to review different incremental techniques that can ruin the polymerization shrinkage stress of direct composite restoration.
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Authors
Gorseta K; Glavina D.
Authors Full Name
Gorseta, Kristina; Glavina, Domagoj.
Institution
Gorseta, Kristina. University of Zagreb, School of Dental Medicine, Department of Paediatric and Preventive Dentistry, Zagreb, Croatia.
Glavina, Domagoj. University of Zagreb, School of Dental Medicine, Department of Paediatric and Preventive Dentistry, Zagreb, Croatia.
Title
Thermo-cured glass ionomer cements in restorative dentistry. [Review]
Source
Abstract
Numerous positive properties of glass ionomer cements including biocompatibility, bioactivity, releasing of fluoride and good adhesion to hard dental tissue even under wet conditions and easy of handling are reasons for their wide use in paediatric and restorative dentistry. Their biggest drawbacks are the weaker mechanical properties. An important step forward in improving GIC's features is thermo-curing with the dental polymerization unit during setting of the material. Due to their slow setting characteristics the GIC is vulnerable to early exposure to moisture. After thermo curing, cements retain all the benefits of GIC with developed better mechanical properties, improved marginal adaptation, increased microhardness and shear bond strength. Adding external energy through thermocuring or ultrasound during the setting of conventional GIC is crucial to achieve faster and better initial mechanical properties. Further clinical studies are needed to confirm these findings.
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Authors
Pardal-Pelaez B; Montero J.
Authors Full Name
Pardal-Pelaez, Beatriz; Montero, Javier.
Institution
Montero, Javier. DDS, PhD in Dentistry. Graduate in Odontology. Tenured Lecturer in Prosthodontics of School of Dentistry. University of Salamanca. Campus Miguel de Unamuno. Salamanca, Spain.
Title
Preload loss of abutment screws after dynamic fatigue in single implant-supported restorations. A systematic review. [Review]
Source
Abstract
Background: To carry out a systematic literature review of the causes of preload loss of the abutment screws, of internal and external connection implants, tightened to different torque values and subjected to cyclic loading.

Material and Methods: A systematic search was conducted in PubMed, EMBASE, and Cochrane Library databases with reference to in vitro studies in which internal and external connection implants were subjected to cyclic loads to determine the degree of loosening of the abutment screws after loading.

Results: The reviewed studies tested distinct implant connections (mostly externally hexed, and morse taper) subjected to diverse cycles (from 16667 to 1 million), with loads ranging from 0-400 Nw, using screws of different materials and designs that were tightened into torques between 20-45 Ncm, Accordingly after loading the percentage of torque loss ranges between 16.1% to 39%.

Conclusions: Most of the studies indicate that the internal connection, together with the morse taper, best resists cyclic loading in terms of screw loosening in single-tooth implants. <b>Key words:</b>Dental Implants, Dental Implant-Abutment Design, Torque, In Vitro Techniques, Systematic Review.

**Bmaxillary simultaneous immediate loading of full-arch restorations: A case series. [Review]**

**MATERIAL AND METHODS:** A prospective case series of 8 patients who required full-arch rehabilitation was conducted. The main inclusion criteria were patients with teeth that required extraction. At least 1 molar per arch was temporarily employed to stabilize the surgical template and the provisional prosthesis during intraoral relining.

**RESULTS:** Two upper implants failed in 1 patient. Structural fracture was registered in 3 patients, around 3 months after loading. All of them had bruxism. Three esthetic complications were registered: midline deviation, canting of the occlusal plane and color mismatch.

**CONCLUSIONS:** Although this protocol achieves optimal results, some mechanical complications were encountered. The fracture of the provisional prosthesis is a relatively common mechanical complication but does not seem to jeopardize the final treatment result. <b>Key words:</b>Implant-supported full-arch, provisional prosthesis fracture, bimaxillary simultaneous rehabilitation, conical abutments.
PURPOSE: To critically discuss adhesive materials and oral cariogenic biofilm in the failure of adhesive resin restorations. [Review]

METHODS: The literature regarding adhesive restoration failures was reviewed with particular emphasis on the chemistry of adhesives, occurring either at one or many stages of restoration. Methodological dissimilarities impeded the direct comparison of the selected studies. Nevertheless, the 2-step etch and rinse adhesives were relatively less vulnerable to salivary contamination than the others. 65% of the evaluated studies for decontamination achieved improved bonding when the contaminated surface was subjected to some kind of decontamination procedure. However, the duration and other specificities were not standard in all the evaluations and need further research to assess the course of action. It is necessary to do long term studies to evaluate the effectiveness of contaminated adhesive over time.

CLINICAL SIGNIFICANCE: Salivary contamination is a potential cause for poor bond quality of adhesive systems during restorative procedures and to provide a successful treatment, proper care must be taken to ensure the operating area is free from contamination. Understanding the properties of the materials and its constituents as well as considering measures to manage the potential vulnerabilities due to salivary contamination in the area of bonding might help a clinician to produce better results.

RESULTS: Salivary contamination of adhesives during restorative procedures statistically (64.6%) showed an adverse effect on adhesives, occurring either at one or many stages of restoration. Methodological dissimilarities impeded the direct comparison of the selected studies. Nevertheless, the 2-step etch and rinse adhesives were relatively less vulnerable to salivary contamination than the others. 65% of the evaluated studies for decontamination achieved improved bonding when the contaminated surface was subjected to some kind of decontamination procedure. However, the duration and other specificities were not standard in all the evaluations and need further research to assess the course of action. It is necessary to do long term studies to evaluate the effectiveness of contaminated adhesive over time.

METHODS: A detailed search on PUBMED, Cochrane Library, Google Scholar and Web of Science was carried out to identify publications on salivary contamination and dental adhesive materials, from 1990-2017 (March) which resulted in a total of 6,202 web-identified publications. After screening titles/abstracts and de-duplicating, 54 publications were selected that matched the requirements for this review. The condition for selection was English literature concerning the effect of salivary contamination on the adhesives used in restorative dentistry. The obtained articles were systematically evaluated.

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RESULTS: There was much evidence that polymerization shrinkage is one of the main drawbacks of composite formulations. Stress results in debonding and marginal leakage into gaps with deleterious effects in bond strength, mechanical properties and the whole stability of restorations. Changes in resins permit passage of fluids and salivary proteins with a biological breakdown of
the restorations. Esterases enzymes in human saliva catalyze exposed ester groups in composite producing monomer by-products, which can favor biofilm accumulation and secondary caries. Adhesive systems may not produce a dense hybrid layer in dentin. Very often this is related to the high viscous solubility and low wettability in dentin of the hydrophobic BisGMA monomer. Thus, dentin hybrid layer may suffer from hydrolysis using both the Etch&Rinse and Self-Etching adhesive systems. In addition, exposed and non-resin enveloped collagen fibers may be degraded by activation of the host-derived matrix metalloproteinase. Plaque accumulation is significantly influenced by the surface properties of the restorations. Biofilm at the contraction gap has demonstrated increased growth of Streptococcus mutans motivated by the chemical hydrolysis of the adhesive monomers at the margins. Streptococcus mutans is able to utilize some polysaccharides from the biofilm to increase the amount of acid in dental plaque with an increase in virulence and destruction of restorations. Stability of resin restorations in the oral environment is highly dependent on the structure of the monomers used in composite and adhesive systems. Still, the issues related to microleakage of fluids into the gap and bacteria leaching from the surface of composites represent the main causes of failure of adhesive restorations.

CLINICAL SIGNIFICANCE: Modifications of adhesive materials are necessary to address their instability in the oral environment.

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**RECENT REVIEWS RELATED TO RESTORATIVE DENTISTRY**

**Title**: Dental Cements for Luting and Bonding Restorations: Self-Adhesive Resin Cements. [Review]


**Abstract**: Self-adhesive resin cements combine easy application of conventional luting materials with improved mechanical properties and bonding capability of resin cements. The presence of functional acidic monomers, dual cure setting mechanism, and fillers capable of neutralizing the initial low pH of the cement are essential elements of the material and should be understood when selecting the ideal luting material for each clinical situation. This article addresses the most relevant aspects of self-adhesive resin cements and their potential impact on clinical performance. Although few clinical studies are available to establish solid clinical evidence, the information presented provides clinical guidance in the dynamic environment of material development.
A survey of the development of dental ceramics is presented to provide a better understanding of the rationale behind the development and clinical indications of each class of ceramic material. Knowledge of the composition, microstructure, and properties of a material is critical for selecting the right material for specific applications. The key to successful ceramic restorations rests on material selection, manufacturing technique, and restoration design, including the balancing of several factors such as residual stresses, tooth contact conditions, tooth size and shape, elastic modulus of the adhesives and tooth structure, and surface state.

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Survival rates against fracture of endodontically treated posterior teeth restored with full-coverage crowns or resin composite restorations: a systematic review. [Review]

Source

Abstract
This systematic review aims to summarize the current clinical studies that investigated survival rates against fracture of endodontically treated posterior teeth restored with crowns or resin composite restorations. Literature search were performed using keywords. Publications from 1980 to 2016 were searched in PubMed, ScienceDirect, Web of Science, MEDLINE, and SCOPUS. Included studies were selected based on inclusion and exclusion criteria. Three clinical studies were included: 1 randomized controlled trial and 1 prospective and 1 retrospective cohort studies. Pooled survival rates ranged from 94%-100% and 91.9%-100% for crowns and resin composite, respectively. The majority of teeth had no more than 3 surface loss of tooth structure. The studies included were heterogeneous, and were not appropriate for further meta-analysis. Current evidence suggested that the survival rates against the fracture of endodontically treated posterior teeth restored with crowns or resin composites were not significantly different in the teeth with minimum to moderate loss of tooth structure.

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Journal Article. Review.
Year of Publication
2017
Glass-ionomer cements (GICs) have been widely used for over forty years, because of their desirable properties in dentistry. The most important advantages of the GICs are associated with their ability to release long-term antimicrobial agents. However, GICs used as restorative materials have still lots of challenges due to their secondary caries and low mechanical properties. Recent studies showed that the fluoride-releasing activity of conventional GICs is inadequate for effectual antibacterial conservation in many cases. Therefore, many efforts have been proposed to modify the antibacterial features of GICs in order to prevent the secondary caries. Particularly, for achieving this goal GICs were incorporated into various biomaterials possessing antibacterial activities. The scope of this review is to assess systematically the extant researches addressing the antibacterial modifications in GICs in order to provide with an authoritative, at the same time in-depth understanding of controlled antibacterial release in this class of biomaterials. It also gives a whole perspective on the future developments of GICs and challenges related to antibacterial GICs.
clinical longevity. This review focuses on the degradation process of resin composites by oral biofilms, the mechanisms of degradation and its consequences. In addition, potential future developments in the area of resin-based dental biomaterials with an emphasis on anti-biofilm strategies are also reviewed.

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**Authors**
- Ntovas P; Doukoudakis S; Tzoutzas J; Lagouvardos P.

**Authors Full Name**
- Ntovas, Panagiotis; Doukoudakis, Spyridon; Tzoutzas, John; Lagouvardos, Panagiotis.

**Institution**
- Ntovas, Panagiotis. Department of Operative Dentistry, Dental School, University of Athens, Athens, Greece.
- Doukoudakis, Spyridon. Department of Operative Dentistry, Dental School, University of Athens, Athens, Greece.
- Tzoutzas, John. Department of Operative Dentistry, Dental School, University of Athens, Athens, Greece.
- Lagouvardos, Panagiotis. Department of Operative Dentistry, Dental School, University of Athens, Athens, Greece.

**Title**
- Evidence provided for the use of oscillating instruments in restorative dentistry: A systematic review. [Review]

**Source**

**Abstract**
- Oscillating diamond instruments are considered gentle sources for the removal of demineralized tooth hard tissues and the preparation of cavity angles and margins needed in minimally invasive dentistry. However, there is a question if literature provides enough evidence for their efficacy in restorative dentistry procedures. A literature search until May 2016 was conducted, using PubMed, Scopus, and The Cochrane Central Register of Controlled Trials databases. The quality of the studies was assessed using the recommendation of the Oxford Centre for Evidence-based Medicine. Fifty-five studies were finally included in the study. Of which, 78.2% of them were laboratory studies and only 21.8% were clinical studies. The strength of recommendation was 5 for most of them and D their grade of evidence. Bond strength of adhesives on surfaces prepared with these instruments, effective caries removal and cutting characteristics of the oscillating instruments were the main targets of the studies. Conventional diamond, steel, and chemical vapor deposition diamond tips and systems based on abrasive slurry were the oscillating tips, used in different studies. The strength of recommendation and grade of evidence of the studies were low. Although these devices seem to be useful for many clinical situations, there is a need for more well-structured evidence-based studies with more widely accepted procedures and common devices, to have more meaningful results and conclusions of higher strength.

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**Authors**
- Donovan TE; Marzola R; Murphy KR; Cagna DR; Eichmiller F; McKee JR; Metz JE; Albouy JP; Troeltzsch M.

**Authors Full Name**
- Donovan, Terence E; Marzola, Riccardo; Murphy, Kevin R; Cagna, David R; Eichmiller, Frederick; McKee, James R; Metz, James E; Albouy, Jean-Pierre; Troeltzsch, Mathias.

**Institution**
- Donovan, Terence E. Chair, Committee on Scientific Investigation, and Professor and Chair, Biomaterials, Department of Operative Dentistry, University of North Carolina School of Dentistry at Chapel Hill, NC. Electronic address: terry_donovan@dentistry.unc.edu.
- Marzola, Riccardo. Private practice, Ferrara, Italy.
- Murphy, Kevin R. Private practice, Baltimore, Md.
- Cagna, David R. Associate Dean, Professor and Director, Advanced Prosthodontics, University of Tennessee Health Sciences Center, Memphis, Tenn.
- Eichmiller, Frederick. Delta Dental, Stevens Point, Wis.
- Metz, James E. Private practice, Columbus, Ohio.
- Albouy, Jean-Pierre. Private practice, Montpellier, France.
- Troeltzsch, Mathias. Private practice, Ansbach, Bavaria, Germany.

**Title**
- Annual review of selected scientific literature: Report of the committee on scientific investigation of the American Academy of Restorative Dentistry. [Review]

**Source**
Advanced Implant-Prosthetic Rehabilitation: How to Obtain a Correct Restoration of Both Functions and Aesthetics in Patients with Complex Combined Dental and Maxillofacial Trauma: A Case Report and Topical Review of the Literature.

Aim. This study aims to explain the main steps that characterize the implant-prosthetic rehabilitation in complex combined dental and maxillofacial trauma. Material and Methods. A 20-year-old patient reported an extensive facial trauma which also involved the alveolar process of the maxillary bone. The patient reported a maxillofacial fracture and the loss of teeth 1.3, 1.2, 1.1, and 2.1. A "Le Fort" type 2 fracture was also reported, with the malar bone involvement. After reduction and containment of bone fractures, through appropriate mounting plates, appropriate functional and aesthetic rehabilitation of the patient were replaced thanks to a temporary removable prosthesis. After 6 months, the patient performed numerous clinical investigations, aimed at a proper planning of implant-prosthetic rehabilitation of the upper dental arch. Conclusion. With the planning of the case, as well as respecting the surrounding biological structures, the surgery of implants can be carried out with the most appropriate procedure. Lastly, new dental implants with highly bioactive surfaces have been developed, providing an excellent and rapid bone integration.
**RECENT REVIEWS RELATED TO RESTORATIVE DENTISTRY**

Clinician assessments and patient perspectives of single-tooth implant restorations in the esthetic zone of the maxilla: A systematic review. [Review]

Source

Abstract
STATEMENT OF PROBLEM: Esthetic outcomes associated with implant dentistry are important to both clinicians and patients. However, esthetic satisfaction may vary between the 2 groups. In order to evaluate the current publications relating to this topic, the following focused question was developed, "what are the quantitative and qualitative differences between clinician evaluations and patient perspectives in the assessment of single-tooth implant outcomes in the esthetic zone?"

PURPOSE: The purpose of this systematic review was to identify differences in esthetic satisfaction between clinicians and patients when evaluating single-tooth implant-supported restorations.

MATERIAL AND METHODS: An electronic search of the Medline database and Cochrane Central Register of Controlled Trials (2000 to 2014) was performed. The search was supplemented by a manual search of specific journals. A quality assessment of full-text articles was performed according to Cochrane Collaboration's tool and Newcastle-Ottawa scale for risk of bias assessment. Information regarding outcomes was collected and compared.

RESULTS: The search term combinations identified 555 titles. Subsequent to further review, 11 publications, including 2 randomized controlled trials, were selected for inclusion. Because of the heterogeneity of the study designs, study interventions, and esthetic assessment methods, no meta-analysis was performed. The clinicians identified a satisfactory outcome in 51% to 100% for peri-implant soft tissue and 62% to 90% for implant restorations. Patients showed a mean range score of 43% to 93% for peri-implant soft tissue and 81% to 96% for implant restorations. The visual analog scale score of the dentists was always lower than that of the patients. The review identified correlations between subjective and objective assessments for the Pink Esthetic Score (PES), the Papilla Index (PI), the Implant Crown Aesthetic Index (ICAI), and the modified (mod-ICAI) indices.

CONCLUSIONS: Clinicians are more critical of esthetic outcomes than patients. The PES and the PI correlated with the patients’ responses concerning the peri-implant soft tissue. The ICAI and the mod-ICAI showed a correlation of both the peri-implant mucosa and implant-supported crown satisfaction. Thus, a comprehensive and practical index should be developed to assess the esthetic outcomes for single-tooth implant restorations in the esthetic zone.

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Authors
Shi Q; Xu J; Zhang T; Zhang B; Liu H.

Authors Full Name
Shi, Quan; Xu, Juan; Zhang, Tong; Zhang, Bin; Liu, Hongchen.

Institution
Shi, Quan. Institute of Stomatology, Chinese PLA General Hospital Beijing, China.
Xu, Juan. Institute of Stomatology, Chinese PLA General Hospital Beijing, China.
Zhang, Tong. Institute of Stomatology, Chinese PLA General Hospital Beijing, China.
Zhang, Bin. Institute of Stomatology, Chinese PLA General Hospital Beijing, China.
Liu, Hongchen. Institute of Stomatology, Chinese PLA General Hospital Beijing, China.

Title

Source

Abstract
Background and Objective: Minor dental surgery is invasive and hemorrhagic. Thus, in patients treated with anticoagulants, the bleeding risk related to these invasive procedures is concerning. The aim of this meta-analysis is to evaluate this risk by comparing the post-operative bleeding rates of oral anticoagulation treatment (OAT) patients (without interrupted or altered anticoagulant intake) with non-OAT patients. Methods: PubMed, Embase and the Cochrane Library were searched for eligible studies that compared the post-operative (following minor dental surgery) bleeding rates of OAT patients without interrupted or altered therapy with those of non-OAT patients. Relative risk (RR) and 95% confidence interval (CI) were calculated. Subgroup analyses were used to identify the association between the bleeding rate and different dental surgeries or anticoagulants.

Results: Thirty two full text articles were assessed for eligibility and 20 studies were excluded according to the selection criteria. Finally, 12 studies and a total of 2102 OAT patients and 2271 non-OAT patients were included. A pooled analysis indicated that the post-operative bleeding risk in OAT patients is higher than that of non-OAT patients (RR: 2.794, 95% CI: 1.722-4.532, P = 0.000). The pooled RRs in the dental implant surgery and dental extraction subgroups were 2.136 (95% CI: 0.825-5.531, P = 0.118) and 2.003 (95% CI: 0.987-4.063, P = 0.054), respectively. As for the different oral anticoagulants, the pooled RR in the subgroup of new oral anticoagulants (NOACs) was 1.603 (95% CI: 0.430-5.980, P = 0.482), while the pooled RR in the subgroup of old oral anticoagulants (warfarin) was 2.203 (95% CI: 0.970-4.972, P = 0.053).
Conclusion: Under current evidence, OAT patients were under a higher post-operative bleeding risk than the non-OAT patients following minor dental surgery. For the dental implant surgeries and dental extractions, our study failed to demonstrate a higher risk of bleeding in the OAT patients compared with the non-OAT patients. Besides, The NOACs might be safer than the vitamin K antagonists in dental implant surgery. However, more well-designed studies are required for future research.

Abstract

OBJECTIVE: There is a trend toward increased use of screw-retained single-implant restorations. A comprehensive literature review was undertaken to examine the data related to screw- and cement-retention and to objectively evaluate the innovations in implant dentistry that have led to this resurgence.

OVERVIEW: When comparing the two options, survival and complication rates are similar, bone and soft-tissue levels are comparable, and zirconia offers esthetic advantages for both selections. Zirconia abutments with bonded titanium inserts provide esthetic alternatives to titanium abutments for both choices. Bone- and soft-tissue responses are similar, but residual cement of cement-retained restorations is associated with significant soft- and hard-tissue complications. The potential weakness of ceramic discontinuity of screw-access openings can be lessened by the incorporation of stronger ceramic materials such as zirconia and lithium disilicate. The overriding remaining indication for cement-retained restorations is to compensate for angled implants.

CONCLUSIONS: Screw-retained single-implant crowns should be reconsidered for many clinical situations for the following reasons: Predictable retention and retrievability No potential for the biologic consequences associated with residual cement As with cement-retained restorations, the choice between metal ceramics or all ceramics Only one margin, at the implant/abutment interface A single abutment/crown ceramic margin that can extend gingivally to the implant interface Nearly imperceptible blend of composite resin in ceramic abutment access openings

CLINICAL SIGNIFICANCE: Innovations in implant and ceramic technology now give screw-retained prostheses the potential for esthetic, functional, and biologic outcomes that are comparable to those for cement-retained prostheses, while providing the advantages of predictable retrievability and avoidance of residual cement. Angle implants, however, remain a major indication for cement-retained single-implant prostheses. (J Esthet Restor Dent 29:161-171, 2017).
Purpose: The aim of this systematic review was to compare the crestal bone loss around splinted and nonsplinted adjacent implants.

Materials and Methods: To address the focused question, "Is crestal bone loss around adjacent implants different with splinted from that with nonsplinted restorations?" indexed databases were searched from 1965 up to and including May 2016 using various combinations of the following keywords: "implant," "splinted," "nonsplinted," "unplanted," "connected," "unconnected," "nonconnected," and "bone loss." Letters to the editor, commentaries, historic reviews, case reports, case series, animal studies, and studies on full-arch rehabilitation were excluded.

Results: Six studies were included with titanium implants ranging from 114 to 1187 implants. All studies had nonsplinted and splinted restorations that ranged from 20 to 234 restorations and from 60 to 970 restorations, respectively. In all the studies, the follow-up period after the restoration placement ranged between 1 and 22 years, with a mean follow-up ranging between 3 and 10.18 +/- 3.18 years. In all studies, the mean crestal bone loss for implants restored with nonsplinted restorations ranged between 0.30 +/- 0.65 and 1.3 +/- 0.2 mm, whereas the mean crestal bone loss for implants restored with splinted restorations ranged between 0.50 +/- 0.8 and 1.22 +/- 0.95 mm.

Conclusion: Within the limitations of this review it is concluded that adjacent implants restored with splinted and nonsplinted fixed restorations did not exhibit a difference in crestal bone loss. The evidence from this systematic review suggests further investigation.

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Authors
Afrashtehfar K I; Ahmadi M; Emami E; Abi-Nader S; Tamimi F.

Institution
Afrashtehfar, K I. Division of Prosthodontics and Restorative Dentistry, Faculty of Dentistry, McGill University, Montreal, QC, Canada.

Afrashtehfar, K I. Department of Reconstructive Dentistry & Gerodontology, School of Dental Medicine, Faculty of Medicine, University of Bern, Berne, Switzerland.

Ahmadi, M. Departement de Dentisterie de Restauration, Faculte de Medecine Dentaire, Universite de Montreal, Montreal, QC, Canada.

Emami, E. Departement de Dentisterie de Restauration, Faculte de Medecine Dentaire, Universite de Montreal, Montreal, QC, Canada.

Abi-Nader, S. Division of Prosthodontics and Restorative Dentistry, Faculty of Dentistry, McGill University, Montreal, QC, Canada.

Abi-Nader, S. Undergraduate Dental Clinics, Faculty of Dentistry, McGill University, Montreal, QC, Canada.

Tamimi, F. Division of Prosthodontics and Restorative Dentistry, Faculty of Dentistry, McGill University, Montreal, QC, Canada.

Tamimi, F. Undergraduate Dental Clinics, Faculty of Dentistry, McGill University, Montreal, QC, Canada.

Title
Failure of single-unit restorations on root filled posterior teeth: a systematic review. [Review]

Source

Abstract
This systematic review investigated the failure rate of conventional single-unit restorations in root filled posterior teeth. Two reviewers independently applied eligibility criteria, extracted data and assessed the quality of the evidence of each included study according to the Cochrane Collaboration's procedures for randomized control trials (RCTs) and the STROBE criteria for observational studies. The MEDLINE (via Ovid), EMBASE (via Ovid), Cochrane Oral Health Group Trials Register and CENTRAL (via Cochrane Library) databases were searched electronically (January 1993 to week 1, February 2015). This was complemented by an additional hand search of selected journals and the references of relevant studies. Clinical studies published on root filled single-unit restorative treatments with a mean follow-up period of at least 3 years were selected. The outcome measured was clinical or radiological failure. Overall, the four RCTs and the single observational study included were of low and high quality, respectively. Therefore, a meta-analysis was not possible. The pooled mean failure rates were reported according to the type of treatment and remaining coronal tooth structure. The current evidence suggested that the failure rates of the treatments may depend on the amount of remaining tooth structure and type of treatment. Post-retained crowns were associated with the most...
favourable outcome in teeth with one to two remaining coronal tooth wall(s), whereas post-free crowns were superior when greater tooth structure was available. Restorations in teeth without ferrules had such a high rate of failure that other treatment options should be considered.

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Authors
Chen Z; Chen D; Zhang S; Tang L; Li Q.
Authors Full Name
Chen, Zhuogeng; Chen, Donghui; Zhang, Shangwei; Tang, Li; Li, Qiuying.
Institution
Chen, Zhuogeng. Department of Implant Dentistry, Haikou People's Hospital, Affiliated Haikou Hospital, Xiangya School of Medicine, Central South University; Hainan Provincial Stomatolgy Center, Haikou, Hainan, China.
Chen, Donghui. Department of Oral Medicine & Periodontology, Stomatolgy Hospital, Guangxi Medical University, Nanning, Guangxi, China.
Zhang, Shangwei. Department of Stomatology, Outpatient Clinic of Guangdong Provincial Government, Guangzhou, Guangdong, China.
Tang, Li. Department of Implant Dentistry, Stomatolgy Hospital, Guangxi Medical University, Nanning, Guangxi, China.
Li, Qiuying. Department of Prosthetics Dentistry, Guangxi National Hospital, Nanning, Guangxi, China.

Title
Antibiotic prophylaxis for preventing dental implant failure and postoperative infection: A systematic review of randomized controlled trials. [Review]
Source

Abstract
PURPOSE: To investigate whether prophylactic antibiotics are beneficial on patients undergoing routine dental implant placement procedures and to investigate which administration regimen is the most effective.

METHODS: The primary outcome was implant failure; the secondary outcome was postoperative infection. In the fixed-effects model, the Mantel-Haenszel method was used to calculate pooled relative risks (RRs) at 95% confidence intervals (CIs). To determine the outcomes, the quality of available evidence was assessed using the Grading of Recommendations Assessment, Development, and Evaluation (GRADE).

RESULTS: Prophylactic antibiotics significantly decreased the incidence of implant failure (RR, 0.29; 95% CI, 0.15-0.55; P= 0.0002; I²= 0%) but did not decrease infection. There was no statistically significant difference between single preoperative antibiotics (SPA) and preoperative and postoperative antibiotics (PPA) while treating patients with dental implant failure (RR, 1.07; 95% CI, 0.31-3.62; P= 0.92). No statistically significant difference was observed between SPA and PPA when prescribed to treat infection postoperatively (RR, 1.05; 95% CI, 0.29-3.85; P= 0.94; I²= 0%).

CLINICAL SIGNIFICANCE: The administration of prophylactic antibiotics significantly reduced the failure of dental implants under ordinary conditions. Furthermore, single preoperative antibiotics and preoperative and postoperative antibiotics had similar effects on dental implant failures and infections.

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Authors
Zhang S; Wang S; Song Y.
Authors Full Name
Zhang, Sijia; Wang, Shuyan; Song, Yingliang.
Institution
Zhang, Sijia. State Key Laboratory of Military Stomatology, Department of Implant Dentistry, School of Stomatology, The Fourth Military Medical University, Shan Xi, Xi'an 710032, PR China.
Wang, Shuyan. State Key Laboratory of Military Stomatology, Department of Preventive Dentistry, School of Stomatology, The Fourth Military Medical University, Shan Xi, Xi'an 710032, PR China.
Risk of caries adjacent to different restoration materials: Systematic review of in situ studies. [Review]

OBJECTIVES: The risk of ‘caries adjacent to restorations’ (CAR) might depend on the used restorative materials. In situ studies are often used to compare the risk of caries adjacent to different materials. We aimed to review in situ studies to evaluate how different materials contribute to risk of CAR.

DATA SOURCES: We included in situ controlled trials comparing directly placed restorative materials, reporting on caries (mineral loss, measured via radiography or micro-hardness) adjacent to these materials. Medline, Embase and Cochrane CENTRAL were systematically searched. Screening and data extraction was performed independently by two authors. Materials were classified according to the used adhesive and restorative materials. Fixed-effects pairwise and frequentistic network meta-analyses were performed. RESULTS: Total 29 RCT with 1342 implants receiving immediate loading and 1279 implants receiving non-immediate loadings were included in this meta-analysis. Results indicated that there was no significant difference between immediate and non-immediate loadings in implant failure rate based on patients (RR = 1.45, 95% CI: 0.79 to 2.68) and implants (RR = 1.38, 95% CI: 0.86 to 2.21). MBL (SMD = -0.11, 95% CI: -0.39 to 0.17), and ISQ (SMD = -0.26, 95% CI: -0.53 to 0.01). Meanwhile, immediate loading showed significantly less MBL change than non-immediate loading. In addition, subgroup analyses showed that the immediate loading indicated slightly higher implant failure rate and lower ISQ than conventional loading.

CONCLUSIONS: Although overall analysis confirmed no inferiority of immediate loading compared with non-immediate loadings, the technique still need to be explored for improving implant success and stability during immediate loading based on the results in subgroup analyses.

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Immediate loading for implant restoration compared with early or conventional loading: A meta-analysis.

OBJECTIVES: This meta-analysis was to further confirm the no inferiority of immediate loading in clinical and radiographic outcomes compared with non-immediate loadings (early or conventional loading).

RESULTS: Total 29 RCT with 1342 implants receiving immediate loading and 1279 implants receiving non-immediate loadings were included in this meta-analysis. Results indicated that there was no significant difference between immediate and non-immediate loadings in implant failure rate based on patients (RR = 1.45, 95% CI: 0.79 to 2.68) and implants (RR = 1.38, 95% CI: 0.86 to 2.21). MBL (SMD = -0.11, 95% CI: -0.39 to 0.17), and ISQ (SMD = -0.26, 95% CI: -0.53 to 0.01). Meanwhile, immediate loading showed significantly less MBL change than non-immediate loading. In addition, subgroup analyses showed that the immediate loading indicated slightly higher implant failure rate and lower ISQ than conventional loading.

CONCLUSIONS: Although overall analysis confirmed no inferiority of immediate loading compared with non-immediate loadings, the technique still need to be explored for improving implant success and stability during immediate loading based on the results in subgroup analyses.
CLINICAL SIGNIFICANCE: While single in situ studies seem to convey consistent and applicable information, the overall body of evidence is inconsistent, limiting the conclusions which can be drawn from it.

Abstract
Resin-based composite (RBC) materials are increasingly being used for the restoration of posterior teeth. The increasing demand for aesthetic, tooth-coloured restorations coupled with the patient's concerns regarding the use of mercury containing restorations, has driven a surge in the use of RBC materials. With the Minamata Convention in 2013 calling for the phase-out of dental amalgam and dental schools increasingly teaching techniques for RBC restorations in posterior teeth, it is likely that the dental profession's reliance upon RBC for the restoration of posterior teeth will only increase. In order to simplify and speed-up the placement of large posterior RBCs, manufacturers have produced a range of materials which can be placed in single or deeper increments, known as bulk-fill RBCs. Over a relatively short period of time many bulk-fill RBCs have been marketed quoting increment depths between 4-10 mm. The placement of these larger increments of RBC may reduce the time needed when placing posterior restorations and thereby reduce technique sensitivity. This article aims to review the properties and handling characteristics of the bulk-fill RBC materials currently available, while advising the optimal techniques of placement.
is based on the conventional restorative approach. Because preschool children are too young to cope with lengthy dental treatment, they often receive dental treatment under general anaesthesia from a specialist dentist. However, treatment under general anaesthesia poses a life-threatening risk to young children. Moreover, there are few dentists in rural areas, where ECC is prevalent. Hence, conventional dental care is unaffordable, inaccessible or unavailable in many communities. However, studies showed that the atraumatic restorative treatment had a very good success rate in treating dentine caries in young children. Silver diamine fluoride is considered safe and effective in arresting dentine caries in primary teeth. The aim of this paper is to review and discuss updated evidence of these alternative approaches in order to manage cavitated ECC.

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2% chlorhexidine does not seem to increase the retention of restorations of noncarious cervical lesions. [Review]

**Comments**

Comment on: J Dent. 2017 May;60:44-49; PMID: 28237629

**Source**


**Abstract**

AIMS: This review assessed the available evidence on the performance of CAD/CAM monolithic implant-supported restorations bonded to titanium (Ti) inserts and bases, which has become a popular concept.

RESULTS: The initial search revealed 505 titles. Full-text screening was carried out for 70 studies, yielding 25 articles that met the inclusion criteria. No clinical studies could be identified regarding the performance of monolithic ceramic restorations bonded to Ti inserts. Laboratory studies on selected aspects and studies on similar prosthetic designs indicate that Ti inserts improve the overall fracture strength of ceramic abutments and crowns, protect the implant connection from wear, and offer a better marginal fit when compared with all-ceramic abutments.
CONCLUSIONS: While laboratory studies and evaluations of similar designs indicated promising outcomes, clinical studies that evaluate the performance of CAD/CAM monolithic implant-supported restorations bonded to Ti inserts and bases are needed.

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Authors
Bidra AS; Rungruanganunt P; Gauthier M.

Title
Clinical outcomes of full arch fixed implant-supported zirconia prostheses: A systematic review. [Review]

Source

Abstract
AIM: The primary aim of this systematic review was to study the clinical outcomes of one-piece fixed complete dentures (complete arch fixed implant-supported prostheses) made of zirconia for edentulous patients. The secondary aim was to compare the clinical outcomes of monolithic zirconia vs zirconia veneered with porcelain (conventional, minimal or gingival) for fixed complete dentures.

MATERIALS AND METHODS: Two investigators conducted an independent electronic search of the literature, using PubMed and Scopus search engines from January 1, 2000, to August 31, 2016. After application of pre-determined inclusion and exclusion criteria, the final list of articles was reviewed to meet the aims of this review.

RESULTS: A total of 12 observational studies were identified that satisfied the inclusion criteria of this systematic review. Short-term results from a combined 223 patients with 285 one-piece zirconia fixed complete dentures showed a mean failure rate of 1.4% due to the fracture of four prostheses. Prosthetic complications occurred in 46 prostheses (16.1%). Out of these, 42 prostheses (14.7%) had minor complications exclusive to fracture of veneered porcelain.

CONCLUSIONS: Current evidence indicates that zirconia fixed complete dentures have a very low failure rate in the short term, but have a substantial rate of minor complications related to chipping of veneered porcelain. Use of monolithic zirconia with only gingival stains, or zirconia that is veneered only at the gingiva may offer promising results, but will need to be validated by future long-term studies. Conflict-of-interest statement: All authors report no conflict of interest.
Abstract

Failure rate of single-unit restorations on posterior vital teeth: A systematic review. [Review]

Purpose: The purpose of this systematic review was to identify the failure rate of conventional single-unit tooth-supported restorations in posterior permanent vital teeth as a function of remaining tooth structure.

Material and methods: Four databases were searched electronically, and 8 selected journals were searched manually up to February 2015. Clinical studies of tooth-supported single-unit restorative treatments with a mean follow-up period of at least 3 years were selected. The outcome measured was the restorations' clinical or radiological failure. Following the Preferred Reporting Items for Systematic reviews and Meta-Analyses guidelines, the Cochrane Collaboration procedures for randomized control trials, the Strengthening the Reporting of Observational Studies in Epidemiology criteria for observational studies, 2 reviewers independently applied eligibility criteria, extracted data, and assessed the quality of the evidence of the included studies using the American Association of Critical Care Nurses' system. The weighted-mean group 5-year failure rates of the restorations were reported according to the type of treatment and remaining tooth structure. A metaregression model was used to assess the correlation between the number of remaining tooth walls and the weighted-mean 5-year failure rates.

Results: Five randomized controlled trials and 9 observational studies were included and their quality ranged from low to moderate. These studies included a total of 358 crowns, 4804 composite resins, and 303582 amalgams. Data obtained from the randomized controlled trials showed that, regardless of the amount of remaining tooth structure, amalgams presented better outcomes than composite resins. Furthermore, in teeth with fewer than 2 remaining walls, high-quality observational studies demonstrated that crowns were better than amalgams. A clear inverse correlation was found between the amount of remaining tooth structure and restoration failure.

Conclusions: Insufficient high-quality data are available to support one restorative treatment or material over another for the restoration of vital posterior teeth. However, the current evidence suggests that the failure rates of treatments may depend on the amount of remaining tooth structure and types of treatment.

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OBJECTIVE: Nowadays bioactive glasses are finding increasing applications in medical practice due to their ability to stimulate re-mineralisation. However, they are intrinsically brittle materials and the study of new compositions will open up new scenarios enhancing their mechanical properties and maintaining the high bioactivity for a broader range of applications. This systematic review aims to identify the relationship between the composition of bioactive glasses used in medical applications and their influence on the mechanical and biological properties.

METHODS: Various electronic databases (PubMed, Science Direct) were used for collecting articles on this subject. This research includes papers from January 2011 to March 2016. PRISMA guidelines for systematic review and meta-analysis have been used. 109 abstracts were collected and screened, 68 articles were read as relevant articles and a total of 22 papers were finally selected for this study.

RESULTS: Most of the studies obtained enhanced mechanical properties and the conservation of bioactivity behaviours; although a lack of homogeneity in the characterization methods makes it difficult to compare data.

SIGNIFICANCE: New compositions of bioactive glasses incorporating specific ions and the addition in polymers will be the most important direction for future researches in developing new materials for medical applications and especially for dentistry.

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Objective: The goal of this manuscript is to provide an overview of biofilm attributes and measurement approaches in the context of studying biofilms on tooth and dental material surfaces to improve oral health.
METHODS: A historical perspective and terminology are presented, followed by a general description of the complexity of oral biofilms. Then, an approach to grouping measurable biofilm properties is presented and considered in relation to biofilm-material interactions and material design strategies to alter biofilms. Finally, the need for measurement assurance in biofilm and biofilm-materials research is discussed.

RESULTS: Biofilms are highly heterogeneous communities that are challenging to quantify. Their characteristics can be broadly categorized into constituents (identity), quantity, structure, and function. These attributes can be measured over time and in response to substrates and external stimuli. Selecting the biofilm attribute(s) of interest and appropriate measurement methods will depend on the application and, in the case of antimicrobial therapies, the strategic approach and expected mechanism of action. To provide measurement assurance, community accepted protocols and guidelines for minimum data and metadata should be established and broadly applied. Consensus standards may help to streamline testing and demonstration of product claims.

SIGNIFICANCE: Understanding oral biofilms and their interactions with tooth and dental material surfaces holds great promise for enabling improvements in oral and overall human health. Both substrate and biofilm properties should be considered to develop a more thorough understanding of the system.

Abstract

OBJECTIVE: To evaluate a range of mechanical parameters of composite resins and compare the data to the frequency of fractures and wear in clinical trials-A systematic review. [Review]

METHODS: Based on a search of PubMed and SCOPUS, clinical studies on posterior composite restorations were investigated with regard to bias by two independent reviewers using Cochrane Collaboration's tool for assessing risk of bias in randomized trials. The target variables were chipping and/or fracture, loss of anatomical form (wear) and a combination of both (summary clinical index). These outcomes were modeled by time and material in a linear mixed effect model including random study and experiment effects. The laboratory data from one test institute were used: flexural strength, flexural modulus, compressive strength, and fracture toughness (all after 24-h storage in distilled water). For some materials flexural strength data after aging in water/saliva/ethanol were available. Besides calculating correlations between clinical and laboratory outcomes, we explored whether a model including a laboratory predictor dichotomized at a cut-off value better predicted a clinical outcome than a linear model.

RESULTS: A total of 74 clinical experiments from 45 studies were included involving 31 materials for which laboratory data were also available. A weak positive correlation between fracture toughness and clinical fractures was found (Spearman \( \rho=0.34 \), \( p=0.11 \)) in addition to a moderate and statistically significant correlation between flexural strength and clinical wear (Spearman \( \rho=0.46 \), \( p=0.01 \)). When excluding those studies with "high" risk of bias (n=18), the correlations were generally weaker with no statistically significant correlation. For aging in ethanol, a very strong correlation was found between flexural strength decrease and clinical index, but this finding was based on only 7 materials (Spearman \( \rho=0.96 \), \( p=0.0001 \)). Prediction was not consistently improved with cutoff values.
SIGNIFICANCE: Correlations between clinical and laboratory outcomes were moderately positive with few significant results, fracture toughness being correlated with clinical fractures and flexural strength with clinical wear. Whether artificial aging enhances the prognostic value needs further investigations.

Composites are increasing in popularity as restorative materials. This growing role indicates the necessity of studies on their clinical outcome. In this study, clinical studies published on the performance of posterior composite restorations were included except those of less than a 24-month assessment period. Results of non-vital, anterior or primary teeth and cervical single-surface restorations were also excluded. Records about composite type, number of final recall restorations, failure/survival rate, assessment period and failure reasons were analysed for each decade. Overall survival/failure rates for studies in 1995-2005 were 89.41%/10.59% and for 2006-2016 were 86.87%/13.13%, respectively. In 1995-2005, the reasons for failure were secondary caries (29.47%) and composite fracture (28.84%) with low tooth fracture (3.45%) compared with reasons of failure in 2006-2016, which were secondary caries (25.68%), composite fracture (39.07%), and tooth fracture (23.76%). An increase in incidence of composite fracture, tooth fracture and need for endodontic treatment as failure reasons was noted in the latter decade in addition to a decrease in secondary caries, postoperative sensitivity, unsatisfactory marginal adaptation and wear. The overall rates of failure showed little difference, but the causes showed a notable change. This is believed to be a reflection of increased use of composites for larger restorations and possibly changes of material characteristics.

BACKGROUND: Fixed prosthodontic treatment (crowns, fixed dental prostheses (FDPs), complete arch prostheses) involves the use of several different materials to replace missing tooth structure. Traditionally full metal or metal frameworks veneered with ceramic (metal-ceramic (MC)) have been used. In recent years several different metal-free systems have become available to clinicians and patients. In general, metal-free restorations should allow practitioners to better reproduce natural tooth colour.
RECENT REVIEWS RELATED TO RESTORATIVE DENTISTRY

OBJECTIVES: To assess the effects of metal-free materials for prosthodontic restorations compared to metal-ceramic or other conventional all-metal materials.

SEARCH METHODS: Cochrane Oral Health's Information Specialist searched the following databases: Cochrane Oral Health's Trials Register (searched 3 May 2017), Cochrane Central Register of Controlled Trials (CENTRAL; 2017, Issue 4) in the Cochrane Library (searched 3 May 2017), MEDLINE Ovid (1946 to 3 May 2017), and Embase Ovid (1980 to 3 May 2017). The US National Institutes of Health Trials Registry (ClinicalTrials.gov) and the World Health Organization International Clinical Trials Registry Platform were searched for ongoing trials (searched 3 May 2017). No restrictions were placed on the language or date of publication when searching the electronic databases.

SELECTION CRITERIA: Randomised controlled trials (RCTs) in which the clinical performance of metal-free fixed prosthodontic restorations was compared with metal-ceramic (MC) or other conventional restorations in adult patients requiring prosthodontic treatment. RCTs in which the clinical performance of different kinds of metal-free systems were compared among themselves were also considered.

DATA COLLECTION AND ANALYSIS: We used standard methodological procedures expected by Cochrane. Screening of eligible studies, assessment of the methodological quality of the trials and data extraction were conducted independently and in duplicate. Trial authors were contacted for missing information. Available results for the outcomes of interest of the systematic review of the studies included were tabulated as they could not be included in a formal meta-analysis.

MAIN RESULTS: Nine trials involving a total of 448 participants were included. We judged two trials to be at unclear risk of bias and seven to be at high risk of bias. The majority of items of risk of bias were evaluated to be at unclear or high risk level in more than 50% of the included trials. Each trial except two was addressing a different type of intervention. All evidence was rated as being of very low quality due to problems with risk of bias and imprecision of results, the latter being due to very small sample sizes, low event rates, 95% confidence intervals including the possibility of benefit for both the test and control groups, or combinations of these problems. This means that we are very uncertain about all of the results presented in this review. One trial compared metal-free single crowns (full contour zirconia) to cast gold single crowns in 224 participants and found insufficient evidence of a difference in failure rate after one year, but after five years there was some evidence of a benefit for the gold crowns.

There was insufficient evidence of a difference for crown complications at either time of assessment. One trial compared three-unit metal-free FDPs (lithium disilicate) to three-unit metal-ceramic FDPs in 37 participants. There was insufficient evidence of a difference in bridge failure at one and six years, but some evidence of a benefit for the lithium disilicate group in terms of bridge complications at six years. One trial compared zirconia-ceramic FDPs to metal-ceramic FDPs in 34 participants but found insufficient evidence of a difference in bridge failures (i.e. no failures in either treatment group), bridge complications or patients' aesthetic evaluation at any time of assessment up to three years.

The overall quality of existing evidence was very low, therefore great caution should be exercised when generalising the results of the included trials. Until more evidence becomes available clinicians should continue to base decisions on which material to use for fixed prosthodontic treatment on their own clinical experience, whilst taking into consideration the individual circumstances and preferences of their patients. There is urgent need of properly designed RCTs.
Atraumatic restorative treatment versus conventional restorative treatment for managing dental caries. [Review]


Abstract

BACKGROUND: Dental caries is a sugar-dependent disease that damages tooth structure and, due to loss of mineral components, may eventually lead to cavitation. Dental caries is the most prevalent disease worldwide and is considered the most important burden of oral health. Conventional treatment methods (drill and fill) involve the use of rotary burs under local anaesthesia. The need for an electricity supply, expensive handpieces and highly trained dental health personnel may limit access to dental treatment, especially in underdeveloped regions. To overcome the limitations of conventional restorative treatment, the Atraumatic Restorative Treatment (ART) was developed, mainly for treating caries in children living in under-served areas of the world where resources and facilities such as electricity and trained manpower are limited. ART is a minimally invasive approach which involves removal of decayed tissue using hand instruments alone, usually without use of anaesthesia and electrically driven equipment, and restoration of the dental cavity with an adhesive material (glass ionomer cement (GIC), composite resins, resin-modified glass-ionomer cement (RM-GICs) and compomers).

OBJECTIVES: To assess the effects of Atraumatic Restorative Treatment (ART) compared with conventional treatment for managing dental caries lesions in the primary and permanent teeth of children and adults.

SEARCH METHODS: Cochrane Oral Health's Information Specialist searched the following databases: Cochrane Oral Health's Trials Register (to 22 February 2017), the Cochrane Central Register of Controlled Trials (CENTRAL) (the Cochrane Library, 2017, Issue 1), MEDLINE Ovid (1946 to 22 February 2017), Embase Ovid (1980 to 22 February 2017), LILACS BIREME Virtual Health Library (Latin American and Caribbean Health Science Information database; 1982 to 22 February 2017) and BBO BIREME Virtual Health Library (Bibliografia Brasileira de Odontologia; 1986 to 22 February 2017). The US National Institutes of Health Trials Registry (ClinicalTrials.gov) and the World Health Organization International Clinical Trials Registry Platform were searched for ongoing trials. No restrictions were placed on the language or date of publication when searching the electronic databases.

SELECTION CRITERIA: We included randomised controlled trials (RCTs) with at least six months' follow-up that compared the effects of ART with a conventional restorative approach using the same or different restorative dental materials to treat caries lesions.

DATA COLLECTION AND ANALYSIS: Two review authors independently screened search results, extracted data from included studies and assessed the risk of bias in those studies. We used standard methodological procedures expected by Cochrane to evaluate risk of bias and synthesise data. Where pooling was appropriate we conducted meta-analyses using the random-effects model. We assessed the quality of the evidence using GRADE criteria.

MAIN RESULTS: We included a total of 15 eligible studies randomising 3760 participants in this review. The age of participants across the studies ranged from 3 to 101 years, with a mean of 25-42 years. 48% of participants were male. All included studies were published between 2002 and 2016. Two of the 15 studies declared that the financial support was from companies that manufacture restorative material. Five studies were individually randomised parallel-group studies; six were cluster-randomised parallel-group studies; and four were randomised studies that used a split-mouth design. Eleven studies evaluated the effects of ART on primary teeth only, and four on permanent teeth. The follow-up period of the included studies ranged from 6 months to 36 months. We judged all studies to be at high risk of bias. For the main comparison of ART compared to conventional treatment using the same material: all but two studies used high-viscosity glass ionomer (H-GIC) as the restorative material; one study used a composite material; and one study used resin-modified glass ionomer cement (RM-GIC). Compared to conventional treatment using H-GIC, ART may increase the risk of restoration failure in the primary dentition, over a follow-up period from 12 to 24 months (OR 1.60, 95% CI 1.13 to 2.27; five studies; 643 participants analysed; low-quality evidence). Our confidence in this effect estimate is limited due to serious concerns over risk of performance and attrition bias. For this comparison, ART may reduce pain during procedure compared with conventional treatment (MD -0.65, 95% CI -1.38 to 0.07; 40 participants analysed; low-quality evidence). Comparisons of ART to conventional treatment using composite or RM-GIC were downgraded to very low quality due to indirectness, imprecision and high risk of performance and attrition bias. Given the very low quality of the evidence from single studies, we are uncertain about the restoration failure of ART compared with conventional treatment using composite over a 24-month follow-up period (OR 1.11, 95% CI 0.54 to 2.29; one study; 57 participants) and ART using RM-GIC in the permanent teeth of older adults with root caries lesions over a six-month follow-up period (OR 2.71, 95% CI 0.94 to 7.81; one study; 64 participants). No studies reported on adverse events or costs.

AUTHORS' CONCLUSIONS: Low-quality evidence suggests that ART using H-GIC may have a higher risk of restoration failure than conventional treatment for caries lesions in primary teeth. The effects of ART using composite and RM-GIC are uncertain due to the very low quality of the evidence and we cannot rely on the findings. Most studies evaluated the effects of ART on the primary dentition. Well-designed RCTs are required that report on restoration failure at clinically meaningful time points, as well as participant-reported outcomes such as pain and discomfort. Due to the potential confounding effects from the use of different dental materials, a robust body of evidence on the effects of ART compared with conventional treatment using the same restoration material is necessary. We identified four ongoing trials that could provide further insights into this area.

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Platelet rich fibrin (PRF) is a surgical biologic additive that is prepared by manipulation of autologous blood. It has now evolved to become one of the most widely used platelet concentrate in dentistry. It has almost replaced Platelet rich plasma (PRP) for usage owing to its advantages such as being 100% autogenous, easy technique, time and cost effectiveness, superior & prolonged growth factor release. It finds varied applications in dentistry including management of gingival recession, for guided bone regeneration in periodontal, peri-implant and endodontic bone defects. Since its inception in 2001 by Choukroun & co-workers, there has been in-depth research regarding its clinical applications, biologic actions, various technique modifications and optimizations. Several modifications of the conventional protocol like the advanced PRF, injectable PRF, PRF lysate and Titanium-prepared PRF. Hence, the aim of this article to review the biological properties of platelet rich fibrin and the advancement in the PRF technology since its inception.

MATERIAL AND METHODS: An electronic search was carried out on MEDLINE-PubMed, The Cochrane Library, and ISI Web of Science databases between 1978 and 2015. Methodological quality assessment was based on Cochrane recommendations. Meta-analyses were assessed with RevMan 5.0 and heterogeneity between studies by the Higgin test (I²). Clinical attachment level (CAL) and probing depth (PD) were the primary outcome variables. Four case series studies were included and three in the meta-analysis. All studies showed high risk of bias.

RESULTS: The surgery promoted significant changes in treated, adjacent, and non-adjacent sites. There were greater changes in PD (mean difference -0.14, 95% CI -0.18 to -0.10, p < 0.00001) and CAL (mean difference 0.16, 95% CI 0.13 to 0.20, p <
CONCLUSION: Crown lengthening surgery results in changes of clinical parameters in treated, adjacent, and non-adjacent sites.

CLINICAL RELEVANCE: Clinical and esthetic alterations on the adjacent/non-adjacent teeth can lead to clinical and esthetic alterations, which must be considered in surgical planning.

Authors
Dhadwal AS; Hurst D.

Institution
Dhadwal, Amardeep Singh. Dental Foundation Trainee, West Midlands, Stafford Scheme.
Hurst, Dominic. Dental Public Health Unit, Barts and The London School of Medicine and Dentistry, Queen Mary University of London, London, UK and Department of Primary Care Health Sciences, University of Oxford, Oxford, UK.

Title
No difference in the long-term clinical performance of direct and indirect inlay/onlay composite restorations in posterior teeth.

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Evidence-Based Dentistry. 18(4):121-122, 2017 12 22.

Abstract
Data sourcesMedline, Embase, the Cochrane Oral Health Group's Trials Register and CENTRAL. Unpublished literature was searched on ClinicalTrials.gov, the National Research Register, and Pro-Quest Dissertation Abstracts and Thesis database. Hand searching of reference lists only.Study selectionRandomised controlled trials with a minimum of three years follow-up that compared direct to indirect inlays or onlays in posterior teeth. Primary outcome was failure (the need to replace or repair). Data extraction and synthesisTwo reviewers independently and in duplicate performed the study selection and two extracted data independently using a customised data extraction form. The unit of analysis was the restored tooth. Risk of bias was assessed using the Cochrane Risk of Bias tool. Meta-analysis was conducted on two studies using the random-effects model. ResultsThree studies were included. Across these studies there were 239 participants in whom 424 restorations were placed. Two studies compared direct and indirect inlays and had follow-up of five and 11 years respectively. One study compared direct and indirect onlays with a follow-up of five years. The studies were at unclear or high risk of bias. For direct and indirect inlays, Relative Risk (RR) of failure after five years was 1.54 (95% CI: 0.42, 5.58; p = 0.52) in one study and, in another was 0.95 (95% CI: 0.34, 2.63; p = 0.92) over 11 years. For onlays there was also no statistically-significant difference in survival, though overall five-year survival was 87% (95% CI: 81-93%). ConclusionsThere is insufficient evidence to favour the direct or indirect technique for the restoration of posterior teeth with inlays and onlays.
The aim of this systematic review was to evaluate implant loss in younger and older patients. An electronic search of four databases (MEDLINE, EMBASE, SCOPUS and the Cochrane Library) was undertaken until May 2016 without time restriction and was supplemented by manual searching. Prospective cohorts were included if they met the following criteria: (i) presence of an exposed group (older subjects) with a minimum age of 60 years; (ii) presence of a control group (younger subjects) with a maximum age of 59 years; and (iii) outcome data considering implant survival or loss. Meta-analyses were performed to evaluate the impact of ageing on implant failure. Of 4152 potentially eligible articles, four were included in the qualitative analysis and quantitative synthesis. The pooled estimates suggest that the risk of implant loss in older patients is not significantly higher (RR = 0.92; 95% CI 0.43–1.96, P = 0.83) when compared to younger subjects. This systematic review suggests that age is not a limiting factor for dental implant therapy.
New adhesives and bonding techniques. Why and when?. [Review]

Source

Abstract
Nowadays, adhesive dentistry is a fundamental part of daily clinical work. The evolution of adhesive materials and techniques has been based on the need for simplicity in the step-by-step procedures to obtain long-lasting direct and indirect restorations. For this reason, recently introduced universal multimode adhesives represent a simple option for creating a hybrid layer, with or without the use of phosphoric acid application. However, it is important to understand the limitations of this latest generation of adhesive systems as well as how to use them on coronal and radicular dentin. Based on the findings in the literature, universal multimode adhesives have shown promising results, even if the problem of hybrid layer degradation due to the hydrolytic activity of matrix metalloproteinases (MMPs) still exists. Studies are therefore required to help us understand how to reduce this degradation.

Publication Type
Journal Article. Review.

Year of Publication
2017

Evaluating the effect of antioxidant agents on shear bond strength of tooth-colored restorative materials after bleaching: A systematic review. [Review]

Source

Abstract
PURPOSE: The main objective of the present study was to make a systematic review of how antioxidant agents affect shear bond strength of tooth-colored restorative materials after bleaching.

DATA SOURCES: Electronic search was used to extract the related articles on the targeted key words such as "antioxidant", "dental bleaching" and "shear bond strength" (SBS) from MeSH, PubMed, Medline, and Cochrane electronic data bases. These articles were all published before 2016.

STUDY SELECTION: Inclusion criteria were restricted to English journal articles concerning humans, clinical trials, cohorts and case-control studies. Therefore, systematic reviews, case reports, letters to editors, editorials and congress abstracts were excluded from the analysis.

CONCLUSIONS: Most studies conducted on the issue have produced experimental data which are rather controversial, and there is no general agreement about the reported outcomes. As an illustration, most studies have not considered the relationship between the type of antioxidant materials and the shear bond strength. In point of fact, some researchers (e.g. Kimyai et al.) have concluded that antioxidants like gel and solution leave similar effects on SBS. Alternatively, certain studies (e.g., Kunt et al.) have produced inconclusive data regarding the impact of one week postponement of the restorative process on SBS after the bleaching process. The results of the studies evaluating the role of various adhesive systems used after bleaching have demonstrated that regardless of the type of adhesive system used, applying antioxidants before restorative procedures can adversely affect the bleaching agents utilized for SBS. It has also been suggested that the type of the adhesive system used might be correlated with the magnitude of SBS. The results obtained from the systematic review of the articles under investigation reflected that the use of antioxidant agents, regardless of their type, form, concentration and duration of application, can improve SBS after bleaching.

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Survival of directly placed ormocer-based restorative materials: A systematic review and meta-analysis of clinical trials.

METHODS: The following databases were explored until 2017/01/08: Ovid MEDLINE In-Process, Pubmed, CENTRAL, HTA, DARE, LILACS and Google Scholar. Studies of more than two years with quantitative comparisons between ormocers and control groups were selected. Outcome was the failure of a restoration (need to repair, remove or replace). Multivariate random-effects Poisson's regression was used to obtain a summary estimate.

RESULTS: 75% of the 8 included trials concerned Class I/II restorations. Although non-significant, the global failures were higher for ormocers (0.22 [0.16; 0.61]). For Class I/II restorations, a significantly higher sensitivity was observed for ormocers (0.75 [0.01; 1.50]). An increase of the number of restorations per patient was associated with higher marginal adaptation failures for ormocers in Class I/II obturations (0.59 [0.11; 1.08]).

SIGNIFICANCE: This study did not identify clear advantages of using the first generation of ormocer-based fillings rather than conventional composite restorations. Given the recent development of new, dimethacrylate-diluent-free ormocer matrices, potentially more stable and resistant, new randomized clinical trials should be developed comparing this new family of pure ormocers with current composites.

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Demonstrated that composite restorations may last long in clinical service. Their esthetic appearance and reduced need of sound tissue removal as compared with former treatments. Several studies have suggested causative relationships. The adopted analytical approach can enhance quality assurance measures and may contribute to facilitated identification of multiple variables associated with implant failure resulting in removal; however, these findings do not suggest causative relationships. The adopted analytical approach can enhance quality assurance measures and may contribute to the identification of true risk factors for dental implant failure.

Abstract

The aim of this study was to use electronic health care records (EHRs) to examine retrospectively the incidence of and attributes associated with dental implant failures necessitating implant removal in a large cohort of patients treated in the student clinics of a U.S. dental school over three and a half years. EHRs were searched for all patients who received dental implants between July 1, 2011, and December 31, 2014. Characteristics of patients and implants that were actively removed due to irreversible failure of any etiology (“failure cohort”) during this period were compared to those of all other patients who received dental implants during the same time frame (“reference cohort”). Differences in the frequency distribution of various characteristics between the failure and reference cohorts were compared. Of a total 6,129 implants placed in 2,127 patients during the study period, 179 implants (2.9%) in 120 patients (5.6%) were removed. In the multivariate analysis, presence of a removable prosthesis (OR=3.71) was statistically significantly associated with increased risk for implant failure. In contrast, antibiotic coverage (pre- and post-surgery OR=0.16; post-surgery only OR=0.38) and implants of certain manufacturers were associated with lower risk of implant failure. In this sizeable cohort of patients receiving care in dental student clinics, the review of EHRs facilitated identification of multiple variables associated with implant failure resulting in removal; however, these findings do not suggest causative relationships. The adopted analytical approach can enhance quality assurance measures and may contribute to the identification of true risk factors for dental implant failure.

Title

Source

Abstract
The aim of this study was to use electronic health care records (EHRs) to examine retrospectively the incidence of and attributes associated with dental implant failures necessitating implant removal in a large cohort of patients treated in the student clinics of a U.S. dental school over three and a half years. EHRs were searched for all patients who received dental implants between July 1, 2011, and December 31, 2014. Characteristics of patients and implants that were actively removed due to irreversible failure of any etiology (“failure cohort”) during this period were compared to those of all other patients who received dental implants during the same time frame (“reference cohort”). Differences in the frequency distribution of various characteristics between the failure and reference cohorts were compared. Of a total 6,129 implants placed in 2,127 patients during the study period, 179 implants (2.9%) in 120 patients (5.6%) were removed. In the multivariate analysis, presence of a removable prosthesis (OR=3.71) was statistically significantly associated with increased risk for implant failure. In contrast, antibiotic coverage (pre- and post-surgery OR=0.16; post-surgery only OR=0.38) and implants of certain manufacturers were associated with lower risk of implant failure. In this sizeable cohort of patients receiving care in dental student clinics, the review of EHRs facilitated identification of multiple variables associated with implant failure resulting in removal; however, these findings do not suggest causative relationships. The adopted analytical approach can enhance quality assurance measures and may contribute to the identification of true risk factors for dental implant failure.

Publication Type
Journal Article.

Year of Publication
2017
the long-term longevity. Composite restorations have demonstrated a good clinical performance with annual failure rates varying from 1% to 3% in posterior teeth and 1% to 5% in anterior teeth. Factors related to the patients such as caries risk and occlusal stress risk, in addition to socioeconomic factors, may affect the survival significantly. Characteristics of the clinical operators, particularly their decision making when it comes to observing or approaching an existing restoration, are decisive for longevity. Cavity features such as the number of restored walls, composite volume, and presence of endodontic treatment are of major importance and may dictate the service time of the restorative approach. The choice of restorative composite seems to have a minor effect on longevity provided that appropriate technical procedures are used. The main reasons for failure in posterior teeth are secondary caries and fracture (restoration or tooth/restoration), while in anterior teeth esthetic concerns are the main reasons leading to restoration failures. Composite resin restorations can be considered a reliable treatment as long as both the professional and the patient are aware of the factors involved in restoration failures.

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Journal Article. Review.
Year of Publication
2017

<77>
Unique Identifier
28902235
VI 1
Status
MEDLINE
Authors
Maas MS; Alania Y; Natale LC; Rodrigues MC; Watts DC; Braga RR.
Authors Full Name
Maas, Mariel Soeiro; Alania, Yvette; Natale, Livia Camargo; Rodrigues, Marcela Charantola; Watts, David Christopher; Braga, Roberto Ruggiero.
Institution
Maas, Mariel Soeiro. Universidade de Sao Paulo - USP, School of Dentistry, Department of Biomaterials and Oral Biology, Sao Paulo, SP, Brazil.
Alania, Yvette. Universidade de Sao Paulo - USP, School of Dentistry, Department of Biomaterials and Oral Biology, Sao Paulo, SP, Brazil.
Natale, Livia Camargo. Universidade de Sao Paulo - USP, School of Dentistry, Department of Biomaterials and Oral Biology, Sao Paulo, SP, Brazil.
Rodrigues, Marcela Charantola. Universidade de Sao Paulo - USP, School of Dentistry, Department of Biomaterials and Oral Biology, Sao Paulo, SP, Brazil.
Watts, David Christopher. University of Manchester School of Medical Sciences, Division of Dentistry, Manchester, United Kingdom.
Braga, Roberto Ruggiero. Universidade de Sao Paulo - USP, School of Dentistry, Department of Biomaterials and Oral Biology, Sao Paulo, SP, Brazil.
Title
Trends in restorative composites research: what is in the future?. [Review]
Source
Abstract
Clinical trials have identified secondary caries and bulk fracture as the main causes for composite restoration failure. As a measure to avoid frequent reinterventions for restoration replacement, composites with some sort of defense mechanism against biofilm formation and demineralization, as well as materials with lower susceptibility to crack propagation are necessary. Also, the restorative procedure with composites are very time-consuming and technically demanding, particularly concerning the application of the adhesive system. Therefore, together with bulk-fill composites, self-adhesive restorative composites could reduce operator error and chairside time. This literature review describes the current stage of development of remineralizing, antibacterial and self-healing composites. Also, an overview of the research on fiber-reinforced composites and self-adhesive composites, both introduced for clinical use in recent years, is presented.
Publication Type
Journal Article. Review.
Year of Publication
2017

<78>
Unique Identifier
28732183
VI 1
Status
MEDLINE
Authors
Fugolin APP; Pfeifer CS.
Authors Full Name
Fugolin, A P P; Pfeifer, C S.
Institution
Fugolin, A P P. 1 Biomaterials and Biomechanics, Oregon Health and Science University, Portland, OR, USA.
Pfeifer, C S. 1 Biomaterials and Biomechanics, Oregon Health and Science University, Portland, OR, USA.
Title
New Resins for Dental Composites. [Review]
Source
Local Messages
Abstract
Restorative composites have evolved significantly since they were first introduced in the early 1960s, with most of the development concentrating on the filler technology. This has led to improved mechanical properties, notably wear resistance, and has expanded the use of composites to larger posterior restorations. On the organic matrix side, concerns over the polymerization stress and the potential damage to the bonded interface have dominated research in the past 20 y, with many "low-shrinkage" composites being launched commercially. The lack of clinical correlation between the use of these materials and improved restoration outcomes has shifted the focus more recently to improving materials' resistance to degradation in the oral environment, caused by aqueous solvents and salivary enzymes, as well as biofilm development. Antimicrobial and ester-free monomers have been developed in the recent past, and evidence is mounting for their potential benefit. This article reviews literature on the newest materials currently on the market and provides an outlook for the future developments needed to improve restoration longevity past the average 10 y.

Publication Type
Journal Article. Review.
Year of Publication
2017

Unique Identifier
28678974

Authors
Marchionatti AME; Wandscher VF; Rippe MP; Kaizer OB; Valandro LF.

Authors Full Name
Marchionatti, Ana Maria Estivalete; Wandscher, Vinicius Felipe; Rippe, Marilia Pivetta; Kaizer, Osvaldo Bazzan; Valandro, Luiz Felipe.

Institution
Marchionatti, Ana Maria Estivalete. Universidade Federal de Santa Maria - UFSM, Faculty of Dentistry, Department of Restorative Dentistry, Santa Maria, RS, Brazil.
Wandscher, Vinicius Felipe. Universidade Federal de Santa Maria - UFSM, Faculty of Dentistry, Department of Restorative Dentistry, Santa Maria, RS, Brazil.
Rippe, Marilia Pivetta. Universidade Federal de Santa Maria - UFSM, Faculty of Dentistry, Department of Restorative Dentistry, Santa Maria, RS, Brazil.
Kaizer, Osvaldo Bazzan. Universidade Federal de Santa Maria - UFSM, Faculty of Dentistry, Department of Restorative Dentistry, Santa Maria, RS, Brazil.
Valandro, Luiz Felipe. Universidade Federal de Santa Maria - UFSM, Faculty of Dentistry, Department of Restorative Dentistry, Santa Maria, RS, Brazil.

Title
Clinical performance and failure modes of pulpless teeth restored with posts: a systematic review. [Review]

Source
Pesquisa Odontologica Brasileira = Brazilian Oral Research. 31:e64, 2017 Jul 03.

Abstract
The aim of this systematic review was to compare the clinical performance and failure modes of teeth restored with intra-radicular retainers. A search was performed on PubMed/Medline, Central and ClinicalTrials databases for randomized clinical trials comparing clinical behavior and failures of at least two types of retainers. From 341 detected papers, 16 were selected for full-text analysis, of which 9 met the eligibility criteria. A manual search added 2 more studies, totaling 11 studies that were included in this review. Evaluated retainers were fiber (prefabricated and customized) and metal (prefabricated and cast) posts, and follow-up ranged from 6 months to 10 years. Most studies showed good clinical behavior for evaluated intra-radicular retainers. Reported survival rates ranged from 71 to 100% for fiber posts and 50 to 97.1% for metal posts. Studies found no difference in the survival among different metal posts and most studies found no difference between fiber and metal posts. Two studies also showed that remaining dentine height, number of walls and ferrule increased the longevity of the restored teeth. Failures of fiber posts were mainly due to post loss of retention, while metal post failures were mostly related to root fracture, post fracture and crown and/or post loss of retention. In conclusion, metal and fiber posts present similar clinical behavior at short to medium term follow-up. Remaining dental structure and ferrule increase the survival of restored pulpless teeth. Studies with longer follow-up are needed.

Publication Type
Journal Article. Review.
Year of Publication
2017

Unique Identifier
28678967
Yengopal, Veerasamy. University of the Witwatersrand, Department of Community Dentistry, Faculty of Health Science, Johannesburg, South Africa.

Title
Reports of uncontrolled clinical trials for directly placed restorations in vital teeth. [Review]

Source
Pesquisa Odontologica Brasileira = Brazilian Oral Research. 31:e48, 2017 Jul 03.

Abstract
Uncontrolled trials are criticized as unreliable. This study aimed to establish how the number of published reports from uncontrolled clinical trials compares to that of controlled trials for directly placed restorations in vital teeth and whether their annual number is increasing, stable or decreasing. PubMed was searched and suitable citations of uncontrolled and controlled trial reports published between 1990-2016 were included. Reference check and hand searching were conducted. The median annual report number with 25 and 75% percentile was calculated for both types of trials. 695 reports were found. The median number of reports per year was 4 (3-7) and 22 (15-26) from uncontrolled and controlled trials, respectively. A statistically significant decreasing ratio of uncontrolled to controlled trial reports was observed (p = 0.01) by linear regression analysis. The number of reports of uncontrolled clinical trials listed in PubMed over the last 27 years appears at least five times smaller than that of controlled clinical trials and its number in relation to that of controlled trials seems to decrease over time.

Publication Type
Journal Article. Review.

Year of Publication
2017

<81>
Unique Identifier
28668102

Status
MEDLINE

Authors
Kalsi H; Rodriguez JM; Darbar U; Bavisha K.

Authors Full Name
Kalsi, Harpoonam; Rodriguez, Jose M; Darbar, Ulpee; Bavisha, Kalpesh.

Title
The Emergency Dental Appointment: Restorative Emergencies Part 2 - Dental Implant Related Problems. [Review]

Source
Primary Dental Journal. 6(2):62-70, 2017 May 01.

Abstract
This is the second paper in a two-part series discussing the management of common restorative dental emergencies. The first paper focussed upon problems relating to conventional fixed and removable restorations, and this paper discusses the management of common dental implant related emergencies. With dental implant treatment becoming an increasingly popular method of replacing missing teeth, it is very likely that dentists working in general practice will routinely come across patients who have previously undergone this form of treatment, even if they themselves are not directly involved in placing or restoring dental implants. This paper is aimed at general dental practitioners (GDPs) who have some experience in managing dental implants, and those who want to gain further insight into how such situations may be managed.

Publication Type
Journal Article. Review.

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2017

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28668101

Status
MEDLINE

Authors
Rodriguez JM; Kalsi H; Bavisha K; Darbar U.

Authors Full Name
Rodriguez, Jose M; Kalsi, Harpoonam; Bavisha, Kalpesh; Darbar, Ulpee.

Title
The Emergency Dental Appointment: Restorative Emergencies Part 1 - Tooth Related Problems. [Review]

Source
Primary Dental Journal. 6(2):52-61, 2017 May 01.

Abstract
Dental emergencies affect a large proportion of the population. While there is ample information in the literature on how to manage medical emergencies in dental practice, there is little information on common dental emergencies and how to manage them. In the UK, the 2009 Adult Dental Health Survey reported 9% of dentate adults reporting pain at their clinical examination. 1 The prevalence of non-pain related restorative dental emergencies is estimated to be higher, and will be a common presenting situation in the dental clinic. Often these unplanned events cause difficulties for dental practitioners, who are already constrained by time, to fit in these patients and manage them. Over and above this, the increasing life spans, retention of teeth into later life
and finite life of dental restorations all add to the challenges encountered by the dental practitioner. Prompt and effective management of these conditions often leads to optimising patient experience, but also offers better outcomes. This two-part series provides an overview of the more common dental emergencies encountered by the dental practitioner and their management.

Paper 1 focuses on the management of common tooth-related emergencies and includes non-odontogenic and odontogenic pain. Paper 2 focuses on the management of osseointegrated dental implant related emergencies.

Publication Type
Journal Article. Review.
Year of Publication
2017

<83>
Unique Identifier
28642558
VI 1
Status
MEDLINE
Authors
Congiusta MA.
Authors Full Name
Congiusta, Marie A.
Institution
Congiusta, Marie A. NYU College of Dentistry, New York, USA.
Title
No differences in longevity of direct and indirect composite restorations.
Comments
Comment on: J Dent. 2016 Nov;54:1-12; PMID: 27523636
Source
Evidence-Based Dentistry. 18(2):46, 2017 06 23.
Abstract
Data sourcesMedline, Cochrane Library, Web of Science, Scopus, Latin American and Caribbean Health Sciences (LILACS), Brazilian Library of Dentistry (BBO), clinicaltrials.gov and SIGLE databases.Study selectionOnly randomised clinical trials were considered that compared direct vs indirect composite restorations, with or without cusp involvement, having a follow-up period of two years or greater.Data extraction and synthesisTwo reviewers selected studies for inclusion, abstracted data and assessed risk of bias. A fixed effects meta-analysis was conducted.ResultsNine studies met the inclusion criteria with six contributing to the meta-analysis. There was no statistically significant difference in clinical longevity for direct and indirect resin composite restorations; relative risk (RR) = 1.494 (95% CI; 0.893-2.500, p = 0.126). Comparing molars and premolars restored with DRC and IRC at three years there was no significant difference; RR = 0.716 (95% CI; 0.177-2.888, p = 0.638).ConclusionsThe results of the review indicate that there is no statistically significant difference in failure rate of direct resin composites vs indirect resin composites. Longitudinal studies on today's improved materials should, however, be considered for further review.

Publication Type
Journal Article. Comment.
Year of Publication
2017

<84>
Unique Identifier
28376962
VI 1
Status
MEDLINE
Authors
Milosevic A.
Authors Full Name
Milosevic, Alex.
Title
Acid Erosion: An Increasingly Relevant Dental Problem. Risk Factors, Management and Restoration. [Review]
Source
Local Messages
THIS JOURNAL IS AVAILABLE IN THE BDA LIBRARY, TO REQUEST THIS ARTICLE FROM THE LIBRARY GO TO:
Abstract
A review of risk factors and management of acid erosion. Particular emphasis is placed on the use of direct composite as a reversible and relatively straightforward restorative option.

Publication Type
Journal Article. Review.
Year of Publication
2017

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Unique Identifier
28376961
VI 1
Status
MEDLINE
BDA LIBRARY MEDLINE SEARCH

RECENT REVIEWS RELATED TO RESTORATIVE DENTISTRY

Authors
Milosevic A.
Authors Full Name
Milosevic, Alex.
Title
Abrasion: A Common Dental Problem Revisited. [Review]
Source
Local Messages
THIS JOURNAL IS AVAILABLE IN THE BDA LIBRARY, TO REQUEST THIS ARTICLE FROM THE LIBRARY GO TO: https://www.bda.org/library/journals-articles/Documents/photocopy-request-form.pdf
Abstract
Dental abrasion is most commonly seen at the cervical necks of teeth, but can occur in any area, even inter-dentally from vigorous and incorrect use of dental floss. Acid erosion has been implicated in the initiation and progress of the cervical lesion, while tooth-brush abrasion has long been held as the prime cause of cervical abrasion. Identification of the risk factors is clearly important in order to modify any habits and provide appropriate advice.
Publication Type
Journal Article. Review.
Year of Publication
2017

<86>
Unique Identifier
28322355
VI 1
Status
MEDLINE
Authors
Jobim Jardim J; Henz S; Barbachan E Silva B.
Authors Full Name
Jobim Jardim, Juliana; Henz, Sandra; Barbachan E Silva, Berenice.
Title
Restorative Treatment Decisions in Posterior Teeth: A Systematic Review. [Review]
Source
Abstract
PURPOSE: To determine the stage of caries in posterior permanent teeth at which dentists decide to intervene invasively.
MATERIALS AND METHODS: A search of the literature from January 1980 to November 2015 available in MEDLINE-PubMed, EMBASE, and the Cochrane Library was conducted. The main search terms used were decision-making, restorative treatment, dental caries lesion, occlusal surface, and approximal surface. The inclusion criterion was studies including dentists only. Three reviewers independently screened titles and abstracts to determine the eligibility of studies. Subsequently, the full texts of the papers deemed eligible were perused and included in the data extraction process.
RESULTS: The review encompassed 11 studies and the methodological quality was considered moderate. Most dentists would restore lesions confined to enamel and reaching the outer half of the dentin, irrespective of the surface involved. With regard to the occlusal surface, the percentage of dentists who restored enamel lesions ranged from 4.6% to 17.8%. Regarding dentin lesions (outer half), 50.2%-70.2% of the dentists opted for invasive treatment. For the approximal surface, the choice for invasive treatment of enamel lesions ranged from 5%-88%. In dentin lesions, 4.4%-94% of dentists restored lesions in the outer half of the dentin.
CONCLUSION: Despite the progress achieved in the understanding of the development and management of caries, dentists still recommend restorative treatment in its early stages.
Publication Type
Journal Article. Review.
Year of Publication
2017

<87>
Unique Identifier
28319206
VI 1
Status
MEDLINE
Authors
Chrcanovic BR; Albrektsson T; Wennerberg A.
Authors Full Name
Chrcanovic, Bruno Ramos; Albrektsson, Tomas; Wennerberg, Ann.
Title
Bone Quality and Quantity and Dental Implant Failure: A Systematic Review and Meta-analysis. [Review]
Source
Local Messages
THIS JOURNAL IS AVAILABLE IN THE BDA LIBRARY, TO REQUEST THIS ARTICLE FROM THE LIBRARY GO TO: https://www.bda.org/library/journals-articles/Documents/photocopy-request-form.pdf
BDA LIBRARY MEDLINE SEARCH

RECENT REVIEWS RELATED TO RESTORATIVE DENTISTRY

Abstract
PURPOSE: The aim of this study was to test the null hypothesis that there is no difference in implant failure rates, marginal bone loss, and postoperative infection for implants inserted in bone with different qualities and quantities according to the classification of Lekholm and Zarb.

MATERIALS AND METHODS: An electronic search was undertaken in January 2015 for randomized and nonrandomized human clinical studies.

RESULTS: A total of 94 publications were included. When bone sites of different qualities were considered, the results suggested the following comparative implant failure rates: 1 > 2, 1 > 3, 3 > 2, 4 > 1, 4 > 2, and 4 > 3. Sensitivity analyses suggested that when implants inserted in bone qualities 1 and 2 and 1 and 3 were compared, oxidized and sandblasted/acid-etched surfaces showed a decrease in significant difference in failures compared with turned implants. The same is not true for failure of implants inserted in bone quality 4 compared to failure of implants in all other bone qualities. When bone sites of different quantities were considered, the following comparative implant failure rates were observed: A > B, A > C, A < D, B < C, B < D, C < D, E > A, E > B, E > C, E > D. Due to insufficient information, meta-analyses for the outcomes postoperative infection and marginal bone loss were not performed.

CONCLUSION: Sites with poorer bone quality and lack of bone volume may statistically affect implant failure rates. Implant surfaces may play a role in failure of implants in different bone qualities.

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Year of Publication
2017

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28318391
VI 1
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Authors
Ferracane JL.
Authors Full Name
Ferracane, J L.
Institution
Ferracane, J L. 1 Division of Biomaterials and Biomechanics, Department of Restorative Dentistry, Oregon Health & Science University, Portland, OR, USA.
Title
Models of Caries Formation around Dental Composite Restorations. [Review]
Source

Local Messages
THIS JOURNAL IS AVAILABLE IN THE BDA LIBRARY. TO REQUEST THIS ARTICLE FROM THE LIBRARY GO TO:

Abstract
The main reason cited for the replacement of dental composite restorations is the recurrence of caries. Numerous models—both in vitro, with acid gels or bacterial biofilms, and in situ, with dental appliances—have been used to study caries formation around dental composites. The literature shows that many factors may affect caries formation, including marginal gap formation, gap size, the local chemical environment, the durability of the bonded interface, the extent of bacterial penetration, and the presence of mechanical loading. Studies have also shown that what have been called wall lesions may form independent of surface lesions, though not likely due to microleakage through very small gap spaces in the clinical situation. Gap size and mechanical loading have been shown to be related to lesion severity within in vitro models, but these results do not correspond exactly with those obtained from in situ studies using restorations in dental appliances. Though not conclusive, some in vitro models have shown that certain materials possessing antimicrobial characteristics may reduce the severity of lesion formation, suggesting possible pathways for developing new composite and adhesive materials for restorations with potentially enhanced longevity.

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Journal Article. Review.
Year of Publication
2017

<89>
Unique Identifier
28267829
VI 1
Status
MEDLINE
Authors
Aldegheishem A; Ioannidis G; Att W; Petridis H.
Authors Full Name
Aldegheishem, Alhanoof; Ioannidis, George; Att, Wael; Petridis, Haralampos.
Title
Success and Survival of Various Types of All-Ceramic Single Crowns: A Critical Review and Analysis of Studies with a Mean Follow-Up of 5 Years or Longer. [Review]
Source
Abstract

**PURPOSE:** The aim of this critical review was to assess the survival and success rates of all-ceramic single crowns manufactured using different ceramic materials with a mean follow-up time of 5 years or longer.

**MATERIALS AND METHODS:** An electronic search of studies published between 1980 and 2014 complemented by manual searching was conducted in Medline and Scopus. The terms ceramic, crown, survival, success, longevity, and complications were selected as keywords. Predetermined inclusion and exclusion criteria guided the search. Data were extracted and assessed by two independent reviewers. The results were statistically analyzed according to the type of material, and survival/success rate was calculated by assuming a Poisson-distributed number of events.

**RESULTS:** The initial search yielded 972 articles. After subsequent filtering, 14 studies were selected. The inter-reviewer agreement was rated as good (kappa = 0.65) and very high agreement (kappa = 0.93) during the identification and screening phases, respectively. No studies on densely sintered zirconia or feldspathic crowns satisfied the minimum follow-up time. Only one study of each of the following materials satisfied the inclusion criteria: lithium disilicate, leucite reinforced, pressed Al2O3, and sintered Al2O3. Meta-analysis of the included studies on other materials resulted in the following estimated survival and success rates: for densely sintered alumina crowns, 93.8% and 92.75%, respectively; for fluoromica reinforced, 87.7% and 87.7%, respectively; and for glass-infiltrated alumina core, 94.4% and 92%, respectively. Crown fracture was considered the most frequent complication.

**CONCLUSION:** Based on the present critical review, there was no evidence to support the superior application of a single ceramic system or material. Further long-term prospective studies are required.

**Publication Type**


**Year of Publication**

2017

**Unique Identifier**

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**Authors**

Innes NPT; Schwendicke F.

**Authors Full Name**

Innes, N P T; Schwendicke, F.

**Institution**

Innes, N P T. 1 Paediatric Dentistry, Dundee Dental Hospital and School, University of Dundee, Dundee, UK.

Schwendicke, F. 2 Department of Operative and Preventive Dentistry, Charite-Universitatsmedizin Berlin, Berlin, Germany.

**Title**

Restorative Thresholds for Carious Lesions: Systematic Review and Meta-analysis. [Review]

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**Abstract**

Current evidence supports noninvasive/nonrestorative treatment of "early" carious lesions: those confined to enamel or reaching the enamel-dentin junction. The extent that dentists' thresholds for intervening restoratively have changed with this evidence is unknown. This systematic review aimed to determine dentists' and therapists' current lesion threshold for carrying out restorative interventions in adults/children and primary/permanent teeth. Embase, Medline via PubMed, and Web of Science were searched for observational studies, without language, time, or quality restrictions. Screening and data extraction were independent and in duplicate. Random-effects meta-analyses with subgroup and meta-regression analysis were performed. Thirty studies, mainly involving dentists, met the inclusion criteria. There was heterogeneity in sampling frames, methods, and scales used to investigate thresholds. The studies spanned 30 y (1983-2014), and sample representativeness and response bias issues were likely to have affected the results. Studies measured what dentists said they would do rather than actually did. Studies represented 17 countries, focusing mainly on adults (n = 17) and permanent teeth (n = 24). For proximal carious lesions confined to enamel (not reaching the enamel-dentin junction), 21% (95% confidence interval [CI], 15%-28%) of dentists/therapists would intervene restoratively. The likelihood of a restorative intervention almost doubled (risk ratio, 1.98; 95% CI, 1.68-2.33) in high caries risk patients. For proximal lesions extending up to the enamel-dentin junction, 48% (95% CI, 40%-56%) of dentists/therapists would intervene restoratively. For occlusal lesions with enamel discoloration/cavitation but no clinical/radiographic dentin involvement, 12% (95% CI, 6%-22%) of dentists/therapists stated they would intervene, increasing to 74% (95% CI, 56%-86%) with dentin involvement. There was variance between countries but no significant temporal trend. A significant proportion of dentists/therapists said they would intervene restoratively (restoratively) on carious lesions where evidence and clinical recommendations indicate less invasive therapies should be used. There is great need to understand decisions to intervene restoratively and to find implementation interventions that translate research evidence into clinical practice.

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**Authors** Fu FH.

**Institution** Fu, Freddie H. University of Pittsburgh Medical Center, 3471 5th Avenue, Suite 1011 Kaufmann Building, Pittsburgh, PA, 15213, USA. ffu@upmc.edu.

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**Authors** Takahashi T; Gonda T; Mizuno Y; Fujinami Y; Maeda Y.

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Removable prosthodontics are often associated with mechanical troubles in daily use, such as fracture or deformation. These troubles render prostheses unusable and reduce wearers' QOL. Various reinforcements are used to prevent such problems, but consensus on reinforcement has not been reached. This review aimed to summarise the effects of reinforcement and to propose favourable reinforcement based on material, design and position in the prostheses. Initially, 139 articles were selected by electronic and manual searches. After exclusion of 99 articles based on the exclusion criteria, 40 articles were finally included in the review. Electronic searches were performed for articles published from 2005 to 2015 in PubMed, EMBASE, MEDLINE and Cochrane Library, and manual searches were performed in 10 journals relevant to the topic of removable prosthodontics. For in vitro studies, certain dental alloys and fibres were mainly used. Their forms were different, including complicated forms in dental alloys and various forms in fibres. The materials were examined for mechanical properties like fracture strength, flexural strength and elastic modulus and compared with one another or without reinforcement. There were a few clinical studies and one longitudinal study. Cast metal reinforcement seemed to be most favourable in terms of fracture toughness and stiffness. The most favourable forms differed depending on the prostheses, but placement around thin and deformable areas was effective. However, randomised or longitudinal clinical reports and comparative clinical studies on the use of reinforcement were still lacking and such studies are necessary in the future.