WHY BOTHER WITH EBD?

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STUDY DESIGNS

- Sys Reviews-Metaanalysis
- RCT's
- Cohort studies
- Case-Control
- Cross-sectional studies
- Case series, Case reports
- Ideas, opinions, editorials, anecdotal
Evidence Pyramid

Less Bias & confounding

Cross-sectional studies?

Evidence Pyramid
Evidence Pyramid

What should be here?
Clinical Practice Guidelines

• 20 years ago: GOBSAT Guidelines
• EB Guidelines: look for or do a systematic review of the literature
Evidence-based clinical practice guideline for the use of pit-and-fissure sealants

A report of the American Dental Association and the American Academy of Pediatric Dentistry

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ABSTRACT

Background. This article presents evidence-based clinical recommendations for the use of pit-and-fissure sealants on the occlusal surfaces of primary and permanent molars in children and adolescents. A guideline panel convened by the American Dental Association (ADA) Council on Scientific Affairs and the American Academy of Pediatric Dentistry conducted a systematic review and formulated recommendations to address clinical questions in relation to the efficacy, retention, and potential side effects of sealants to prevent dental caries; their efficacy compared with fluoride varnishes; and a head-to-head comparison of the different types of sealant material used to prevent caries on pits and fissures of occlusal surfaces.

Types of Studies Reviewed. This is an update of the ADA 2008 recommendations on the use of pit-and-fissure sealants on the occlusal surfaces of primary and permanent molars. The authors conducted a systematic search in MEDLINE, Embase, Cochrane Central Register of Controlled Trials, and other sources to identify randomized
OR=0.24
NNT=2-3
Guidelines Not Being Followed

OR = 0.24

RR = 0.76
RR=0.86
(95%CI 0.79-0.94)
Evidence Not Being Implemented

• Cochrane: OR sealants = 0.24; RR fluoride = 0.76

• Only 40% of dentists using sealants (Tellez, JADA, 2011)

• Qualitative study on sealants: clinical doubts, reimbursement, mistrust of guidelines (O’Donnell, JADA, 2013)
Dental procedures and PJI
The use of prophylactic antibiotics prior to dental procedures in patients with prosthetic joints

Evidence-based clinical practice guideline for dental practitioners—a report of the American Dental Association Council on Scientific Affairs

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ABSTRACT

Background. A panel of experts (the 2014 Panel) convened by the American Dental Association Council on Scientific Affairs developed an evidence-based clinical practice guideline (CPG) on the use of prophylactic antibiotics in patients with prosthetic joints who are undergoing dental procedures. This CPG is intended to clarify the “Prevention of Orthopaedic Implant Infection in Patients Undergoing Dental Procedures: Evidence-based Guideline and Evidence Report,” which was developed and published by the American Academy of Orthopaedic Surgeons and the American Dental Association (the 2012 Panel).

Types of Studies Reviewed. The 2014 Panel based the current CPG on literature search results and direct evidence contained in the comprehensive systematic review published by the 2012 Panel, as well as the results from an updated literature search. The 2014 Panel identified 4 case-control studies.

Results. The 2014 Panel judged that the current best evidence failed to demonstrate an association between dental procedures and prosthetic joint infection (PJI).
Antibiotics & Bacteremia

- dental procedures produce bacteremia
- no evidence oral bacteremia causes pji
- effect of ab on bacteremia unknown
- adverse effects of antibiotics
- chewing & tooth brushing cause bacteremia
Evidence-based clinical practice guideline on the nonsurgical treatment of chronic periodontitis by means of scaling and root planing with or without adjuncts

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ABSTRACT

Background. A panel of experts convened by the American Dental Association Council on Scientific Affairs presents an evidence-based clinical practice guideline on nonsurgical treatment of patients with chronic periodontitis by means of scaling and root planing (SRP) with or without adjuncts.

Methods. The authors developed this clinical practice guideline according to the American Dental Association’s evidence-based guideline development methodology, and it is founded on a systematic review of the evidence that included 72 research articles providing clinical attachment level data on trials of at least 6 months’ duration and published in English through July 2014. The strength of each recommendation (strong, in favor, weak, expert opinion for, expert opinion against, and against) is based on an assessment of the level of certainty in the evidence for the treatment’s benefit in combination with an assessment of the balance between the magnitude of the benefit and the potential for adverse effects.

Practical Implications and Conclusions. For patients with chronic periodontitis, SRP showed a moderate benefit, and the benefits were judged to outweigh potential adverse effects. The authors voted in favor of SRP as the initial nonsurgical treatment for chronic periodontitis. Although systemic subantimicrobial-dose doxycycline and systemic antimicrobials showed similar magnitudes of benefit and were not judged to have higher potential for adverse effects, SRP may be preferable as initial treatment for patients with moderate to severe periodontal disease. Photodynamic therapy and erbium lasers were recommended in favor as adjunctive therapies to SRP. In the absence of higher-quality evidence for other lasers, the authors voted against recommending those treatments as adjuncts to SRP.
Dental Pain

What meds do we give for this???
OPIOIDS

- Codeine
- Oxycodone
- Morphine
- Fentanyl
- Hydromorphone
- Methadone
Repercussions of a fractured tooth
The American Cancer Society (ACS) estimated that there would be 35,720 new cases of cancer of the oral and pharyngeal region in the United States in 2009, with 7,600 deaths from the disease.

When focusing specifically on the oral cavity, ACS estimated that in 2009, there would be 23,110 new cases of cancer of the oral cavity (hereafter referred to as "oral cancer") and 5,370 deaths. Nearly 90 percent of these malignancies are squamous cell carcinomas.

More than 97 percent of U.S. cases of these cancers occur among adults 35 years and older. Although the incidence rate (IR) of oral and pharyngeal cancers is decreasing overall, the IR of cancers of the tongue, oropharynx and tonsil is increasing.

The 2002–2006 age-adjusted (to the 2000 U.S. population) IR of oral and pharyngeal cancers in the United States was 10.3 per 100,000 per year. The age-adjusted IR was more than twice as high among men (15.9) as among women (6.0), as was the mortality rate (men, 4.0; women, 1.5).

Evidence-based clinical recommendations regarding screening for oral squamous cell carcinomas

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Background. This article presents evidence-based clinical recommendations developed by a panel convened by the American Dental Association Council on Scientific Affairs. This report addresses the potential benefits and potential risks of screening for oral squamous cell carcinomas and the use of adjunctive screening aids to
Dental School “Rules”

1. All endo teeth need posts/crowns
2. All missing teeth must be replaced
3. All cases mounted in centric relation
4. Border mould / face-bow / split-cast a must!!
5. Never use cantilevers
6. Complete caries removal
BOUNDED EDENTULOUS SPACES
TRADITIONAL APPROACH

All missing teeth must be replaced to restore function and to avoid arch collapse.
EB APPROACH

• Implant vs. fixed bridge survival
• Is partial edentulism a condition or a pathologic entity?
• No treatment leads to a minor self-limiting movement of teeth within first year post-extraction
TREATMENT OPTIONS

• 3-unit fixed bridge
• Single-tooth implant
• Removable prosthesis
• No treatment!!
Partial Caries vs Complete Caries Removal
Operative caries management in adults and children (Review)

Ricketts D, Lamont T, Innes NPT, Kidd E, Clarkson JE
AMALGAM VS. COMPOSITE
AMALGAM VS. COMPOSITE

RR=3.5 (Bernardo, JADA, 2007)

RR=2.14 (Cochrane Review, 2014)
Problems with Published Research

Association vs. Causality

Diet Coke?

No thanks, aspartame causes cancer
Correlations

- Smoking and lung cancer
- Periodontal disease and grey hair?
- What study design can show ‘cause and effect’?
- What type of pathology can most easily demonstrate cause/effect?
- The short list
Today's Random Medical News

Can cause:
- Hypothermia
- Vision loss
- Depression

In:
- Men 25-40
- Two-income families
- Overweight smokers

According to a report released today...
Periodontal Disease and Atherosclerotic Vascular Disease: Does the Evidence Support an Independent Association? A Scientific Statement From the American Heart Association

The American Dental Association Council on Scientific Affairs Concurs With the Conclusions of This Report

Endorsed by the World Heart Federation

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Abstract—A link between oral health and cardiovascular disease has been proposed for more than a century. Recently, concern about possible links between periodontal disease (PD) and atherosclerotic vascular disease (ASVD) has intensified and is driving an active field of investigation into possible association and causality. The 2 disorders share several common risk factors, including cigarette smoking, age, and diabetes mellitus. Patients and providers are increasingly presented with claims that PD treatment strategies offer ASVD protection; these claims are often endorsed by professional and industrial stakeholders. The focus of this review is to assess whether available data support an independent association between ASVD and PD and whether PD treatment might modify ASVD risks or outcomes. It also presents mechanistic details of both PD and ASVD relevant to this topic. The correlation of PD with ASVD outcomes and surrogate markers is discussed, as well as the correlation of response to PD therapy with ASVD event rates. Methodological issues that complicate studies of this association are outlined, with an emphasis on the terms and metrics that would be applicable in future studies. Observational studies to date support an association between PD and ASVD independent of known confounders. They do not, however, support a causative relationship. Although periodontal interventions result in a reduction in systemic inflammation and endothelial dysfunction in short-term studies, there is no evidence that they prevent ASVD or modify its outcomes. (Circulation. 2012;125:2520-2544.)
Periodontal infection and preterm birth: successful periodontal therapy reduces the risk of preterm birth

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Accepted 28 July 2010. Published Online 15 September 2010.

Objective This study tested the hypothesis that successful periodontal treatment was associated with a reduction in the incidence of spontaneous preterm birth (PTB).

Design This was a randomised, controlled, blinded clinical trial.

Setting Hospital outpatient clinic.

Population Pregnant women of 6–20 weeks of gestation were eligible.

Methods Of 322 pregnant women with periodontal disease, 160 were randomly assigned to receive scaling and root planing (SRP), placebo periodontal treatment or no treatment. The remaining 162 subjects were assigned to the control group. The primary outcomes were the incidence of PTB, the date of delivery and gestational age at delivery. The secondary outcome was the incidence of preterm birth (35 weeks of gestation or less). The chi-square test or logistic regression. Results are presented in terms of odds ratios. Results

Main outcome measure The main outcome measure was spontaneous preterm birth before 35 weeks of gestation.

Results No significant difference was found between the incidence of PTB in the control group (52.4%; n = 162) and the periodontal treatment group (45.6%; n = 160) (P < 0.13, Fisher’s exact test). The incidence of PTB was compared within the periodontal treatment group, considering the success of therapy. A logistic regression analysis showed a strong and significant relationship between success of periodontal treatment and full-term birth.
OBSTETRICS

Treatment of localized periodontal disease in pregnancy does not reduce the occurrence of preterm birth: results from the Periodontal Infections and Prematurity Study (PIPS)

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OBJECTIVE: The purpose of this study was to test whether treating periodontal disease (PD) in pregnancy will reduce the incidence of spontaneous preterm delivery (SPTD) at ≤ 35 weeks of gestation.

STUDY DESIGN: A multicenter, randomized clinical trial was performed. Subjects with PD were randomized to scaling and root planing (active) or tooth polishing (control). The primary outcome was the occurrence of SPTD at < 35 weeks of gestation.

RESULTS: We screened 3563 subjects for PD; the prevalence of PD was 50%. Seven hundred fifty-seven subjects were assigned randomly; 378 subjects were assigned to the active group, and 379 subjects were assigned to the placebo group. Active treatment did not reduce the risk of SPTD at < 35 weeks of gestation (relative risk, 1.19; 95% confidence interval [CI], 0.62–2.28) or composite neonatal morbidity (relative risk, 1.30; 95% CI, 0.83–2.04). There was a suggestion of an increase in the risk of indicated SPTD at < 35 weeks of gestation in those subjects who received active treatment (relative risk, 3.01; 95% CI, 0.95–4.24).

CONCLUSION: Treating periodontal disease does not reduce the incidence of SPTD.

Key words: periodontal disease, spontaneous preterm delivery


Preterm birth, which remains a major inflammatory response can lead to preterm birth.
A nationwide population-based study on the association between chronic periodontitis and erectile dysfunction


Abstract

Aim: To explore the association between chronic periodontitis (CP) and erectile dysfunction (ED) by using a nationwide, population-based dataset with a retrospective case-control design in Taiwan.

Material and Methods: We identified 32,856 patients with ED as cases and randomly selected 162,480 patients as controls. Conditional logistic regression analyses were performed to investigate the association between ED and having been previously diagnosed with CP.

Results: Of the sampled patients 24,294 (12.3%) had been diagnosed with CP prior to the index date; this included 8825 cases (26.9% of the patients with ED)
The effect of periodontal treatment in improving erectile dysfunction: a randomized controlled trial


Abstract
Objective: The aim of the study was to evaluate changes in the International Index of Erectile Dysfunction (IIEF) score following periodontal treatment in patients who had severe or moderate erectile dysfunction (ED) and chronic periodontitis (CP).
Materials and methods: The authors declare that they have no conflict of interest. The study population consisted of 120 patients with severe or moderate ED and CP. The treatment group (n = 60) comprised patients who received periodontal treatment, whereas the control group (n = 60) comprised patients who did not receive periodontal treatment. The clinical assessments were recorded at baseline, and at 1 month (R1) and 3 months (R2) after intervention for both groups. The periodontal examination involved assessment of the plaque index, bleeding on probing, probing depth and clinical attachment level. The IIEF questionnaire was used to assess the severity of ED.
Results: In the treatment group, the improvement in all clinical periodontal parameters was greater than that in the control group, at both R1 and R2 (p < 0.05). The increase in the IIEF scores of the treatment group at R2 was higher than that of the control group (p < 0.05), whereas the IIEF scores were similar between the two groups at R1.
Association vs. Causality

- **Strength**: is the risk so large that we can easily rule out other factors
- **Consistency**: have the results have been replicated by different researchers and under different conditions
- **Specificity**: is the exposure associated with a very specific disease as opposed to a wide range of diseases
- **Temporality**: did the exposure precede the disease
- **Biological gradient**: are increasing exposures associated with increasing risks of disease
- **Plausibility**: is there a credible scientific mechanism that can explain the association
- **Coherence**: is the association consistent with the natural history of the disease
- **Experimental evidence**: does a physical intervention show results consistent with the association
- **Analogy**: is there a similar result that we can draw a relationship to
Beta-carotene & cardiovascular mortality

Cohorts
- Male health workers
- Social insurance, men
- Social insurance, women
- Male chemical workers
- Hyperlipidaemic men
- Nursing home residents

Trials
- Male smokers
- Skin cancer patients
- (Ex)-smokers, asbestos workers
- Male physicians

Relative risk (95% CI)
Why Most Published Research Findings Are False
John P. A. Ioannidis

Summary
There is increasing concern that most current published research findings are false. The probability that a research claim is true may depend on study power and bias, the number of other studies on the same question, and, importantly, the ratio of true to no relationships among the relationships probed in each scientific field. In this framework, a research finding is less likely to be true when the studies conducted in a field are smaller; when effect sizes are smaller; when there is a greater number and lesser preselection of tested relationships; where there is greater flexibility in designs, definitions, outcomes, and analytical modes; when there is greater financial and other interest and prejudice; and when more teams are involved in a scientific field in chase of statistical significance. Simulations show that for most study designs and settings, it is more likely for a research claim to be false than true. Moreover, for many current scientific factors that influence this problem and some corollaries thereof.

Modeling the Framework for False Positive Findings
Several methodologists have pointed out [9–11] that the high rate of nonreplication (lack of confirmation) of research discoveries is a consequence of the convenient, yet ill-founded strategy of claiming conclusive research findings solely on the basis of a single study assessed by formal statistical significance, typically for a $p$-value less than 0.05. Research is not most appropriately represented and summarized by $p$-values, but, unfortunately, there is a widespread notion that medical research articles is characteristic of the field and can vary a lot depending on whether the field targets highly likely relationships or searches for only one or a few true relationships among thousands and millions of hypotheses that may be postulated. Let us also consider, for computational simplicity, circumscribed fields where either there is only one true relationship (among many that can be hypothesized) or the power is similar to find any of the several existing true relationships. The pre-study probability of a relationship being true is $R/(R + 1)$. The probability of a study finding a true relationship reflects the power $1 - \beta$ (one minus the Type II error rate). The probability of claiming a relationship when none truly exists reflects the Type I error rate, $\alpha$. Assuming that $\epsilon$ relationships are being probed in the field, the expected values of the $2 \times 2$ table are given in Table 1. After a research finding has been claimed based on achieving formal statistical significance, a higher threshold might be considered.

It can be proven that most claimed research findings are false.

should be interpreted based only on...
The holy grail of published research is $P < 0.05$
Statistical Significance ≠ Clinical Relevance
Thank You!