



The history of systematic reviews in dentistry

What have we learned from systematic reviews of dental topics?

Asbjørn Jokstad
University of Oslo, Norway

Medline reviews – medicine & dentistry

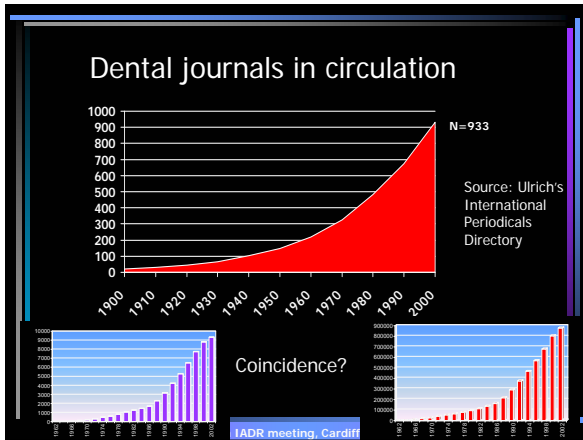


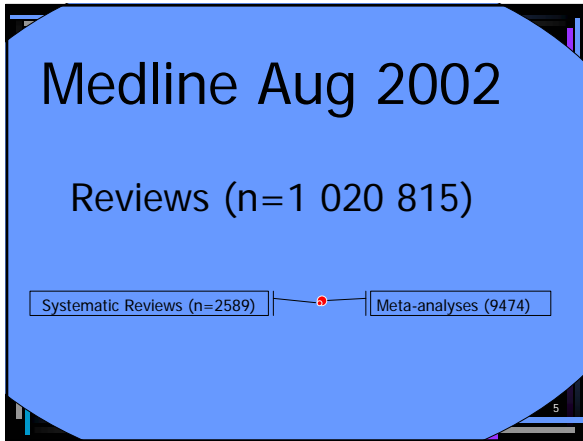
1st. Pan-European IADR meeting, Cardiff, 25 September 2002

Medline reviews - dentistry



1st. Pan-European IADR meeting, Cardiff, 25 September 2002





NCBI PubMed National Library of Medicine

Systematic review OR meta-analysis

11466 **Chavakis JS, Cigarette ST, A, Strawn JL.** Biofilms and suboptimal patients: A retrospective study. *Am J Psychiatry*. 1971 Dec;128(12):2275-84. PMID: 1200169 [PubMed - indexed for MEDLINE]

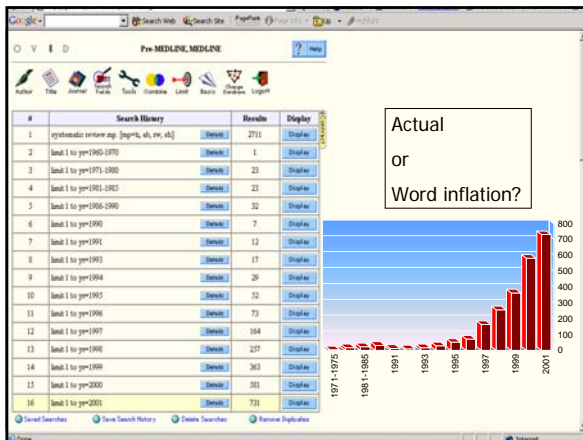
11467 **Miles RH, Schwab H, Brown R, McLean D.** A new consideration in elliptic equine: The closed orbit disease. *Can J Otolaryngol*. 1971 Sep;1(11):181-91. PMID: 12506 [PubMed - indexed for MEDLINE]

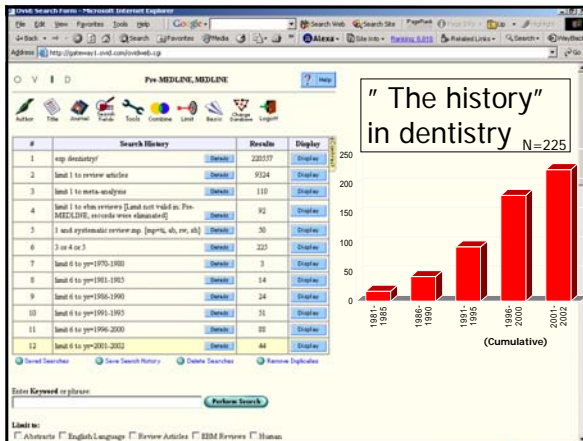
11468 **Cookson B.** A systematic review of the *group A streptococci* (A streptococci) Mycobacterium. *Am J Respir Crit Care Med*. 1971 Nov;104(5):745-55. No abstract available. PMID: 4264851 [PubMed - indexed for MEDLINE]

11469 **Levy J.** Anticholinergic blockade: a systematic review of anticholinergics, anticholinergics, and anticholinergic antagonists. *Psychol Bull*. 1971 Dec;76(6):431-14. No abstract available. PMID: 4266651 [PubMed - indexed for MEDLINE]

11470 **Smolke JW, Omond HC, Evans G.** [Comparing the mean and standard deviation (SD) of a distribution of results]. *Montreal J Epidemiol*. 1971 Dec;1(1):2:62-3. Ottawa. No abstract available. PMID: 715040 [PubMed - indexed for MEDLINE]

"Systematic reviews" in 1971, 1972, 1973?

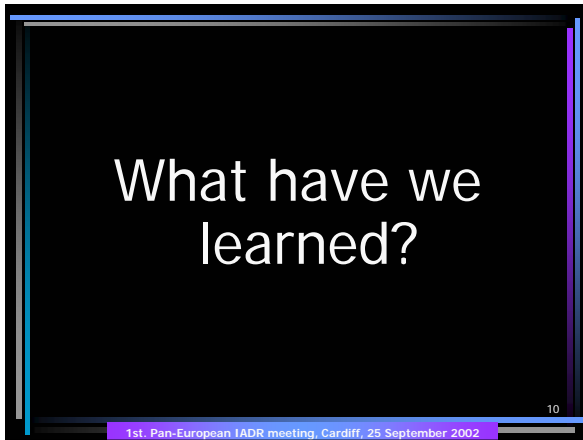


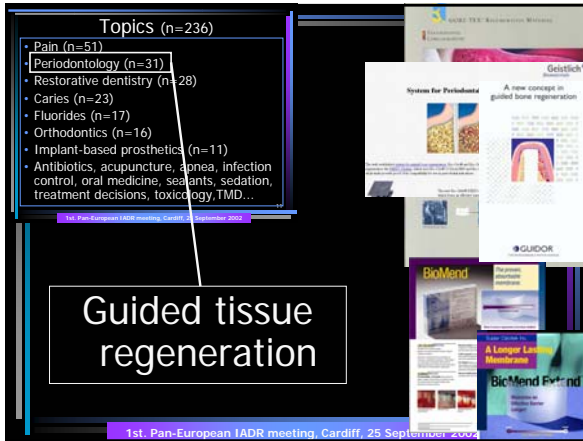


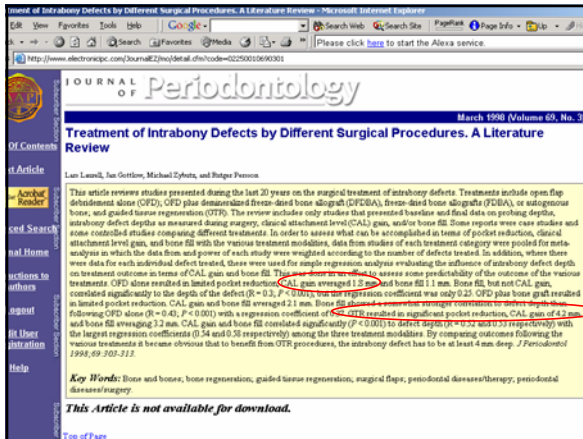
Topics (n=236)

- Pain & pharmacotherapy (n=51)
- Periodontology (n=31)
- Restorative dentistry (n=28)
- Caries (n=23)
- Fluoride issues (n=17)
- Orthodontics (n=16)
- Implant-related (n=11)
- Antibiotics, acupuncture, apnea, infection control, oral medicine, sealants, sedation, treatment decisions, toxicology, TMD...

1st. Pan-European IADR meeting, Cardiff, 25 September 2002







Focus on intrabony defects: guided tissue regeneration

Table 2. Controlled clinical trials comparing guided tissue regeneration procedure with access flap procedures

Authors	Type of membrane	n (guided tissue regeneration)	Guided tissue regeneration probing attachment gain±SD (mm)	n (flap)	Flap probing attachment gain±SD (mm)
Chang et al. (18)	Collagen	10	0.6±0.6	10	-0.7±0.9
Ogata et al. (19)	Collagen	20	3.0±1.5	20	1.0±0.9
Prosser et al. (24)	Expanded polytetrafluoroethylene	9	1.2±2.0	9	0.6±1.0
Al-Arjoud et al. (1)	Collagen	14	3.9	14	2.7
Mattson et al. (26)	Collagen	9	2.4±2.1	9	0.4±2.1
Cortellini et al. (27)*	Expanded polytetrafluoroethylene	13	4.1±1.9	15	2.5±0.8
Cortellini et al. (27)	Titanium-reinforced expanded polytetrafluoroethylene	15	5.3±2.2	-	-
Cortellini et al. (32)*	Expanded polytetrafluoroethylene	12	5.2±1.4	12	2.3±0.8
Cortellini et al. (33)	Polymer	12	3.6±2.2	-	-
Ann (5)	Expanded polytetrafluoroethylene	19	4.0±2.1	18	2.0±1.2
Kirk (52)	Expanded polytetrafluoroethylene	10	3.7±2.0	10	2.1±2.0
Tonetti (44)	Polymer	60	3.0±1.6	67	2.2±1.5
Cortellini (16)	Polymer	21	3.9±1.8	21	2.0±1.4
Weighted mean		243	3.4±1.8	213	1.6±1.4

* These are studies. Comparisons were made among two different levels of defects.

Cortellini P, Tonetti M.
Focus on intrabony defects: guided tissue regeneration.
Periodontology 2000 2000;22:104-132.

GUIDED TISSUE REGENERATION FOR PERIODONTAL INFRA-BONY DEFECTS

Reviewers: IL, Guido-Leeper E, Tucker RJ, Worthington HW

Date of most recent update: 6 August 2001
Date of most recent substantive update: 20 May 1999

This review should be cited as: Needleman IS, Guido-Leeper E, Tucker RJ, Worthington HW. Guided tissue regeneration for periodontal infra-bony defects (Cochrane Review). In: The Cochrane Library. Issue 2, 2000. Oxford: Update Software.

ABSTRACT

Background
Conventional treatment of destructive periodontal (gum) disease arrests the disease but does not regen the bone support or connective tissue lost in the disease process. Guided tissue regeneration (GTR) is a surgical procedure that aims to regenerate the periodontal tissues when the disease is advanced and could reverse some of the limitations of conventional therapy.

Objectives
To assess the efficacy of GTR in the treatment of periodontal infra-bony defects measured against the current standard of surgical periodontal treatment, open flap debridement.

Search Strategy
We conducted an electronic search of the Cochrane Oral Health Group periodontal trials register and MEDLINE up to October 2000. Hand searching included *Journal of Periodontology*, *Journal of Clinical Periodontology*, *Journal of Periodontal Research* and bibliographies of all relevant papers and review articles up to October 2000. In addition, we contacted experts in the field to ensure that no relevant trials were missed in surgical research or unpublished material or to clarify ambiguous or missing data and protocol requests for data on two periodontal electronic discussion groups.

Selection Criteria
Randomised controlled trials of at least 12 months duration comparing guided tissue regeneration (with or without graft material) with open flap debridement for the treatment of periodontal infra-bony defects. Furcation involvements and studies specifically treating early onset diseases were excluded.

Data collection and analysis
Screening of possible studies was conducted independently by two reviewers (DT & JW) and data abstraction by three reviewers (DT, IN & ELL). The methodological quality of studies was assessed in duplicate (DT & JW) using both individual components and a quality score (David 1998) and agreement determined by kappa scores. Methodological quality was used in sensitivity analyses to test the robustness of the conclusions. The Cochrane Oral Health Group electronic databases were followed (DT) and the results expressed as weighted mean difference (95% CI) for continuous outcomes and relative risk (RR) and 95% CI for dichotomous outcomes calculated using random effects models where significant heterogeneity was detected (P < 0.1). The final analysis was conducted using GRADE in order to combine both parallel group studies and some individual (single mouth) studies. The primary outcome measure was gain in clinical attachment. Any heterogeneity was investigated.

Main Results
We initially included 23 trial reports. Twelve were subsequently excluded. Of these, seven presented zero-months data only, four were not fully randomised controlled trials, one used a non-randomised (single mouth) technique. Eleven studies were finally included in this review. Six testing GTR alone and five testing GTR versus open flap debridement (one study had both but no treatment arms).

For attachment level change, the weighted mean difference between GTR alone and open flap debridement was 1.1 mm (95% CI: 0.63 to 1.57), chi-square for heterogeneity 21.4 (P < 0.001) and for publication bias was 1.25 mm (95% CI: 0.87 to 1.63), chi-square for heterogeneity 0.01 (P = 1) and 95% CI for publication bias was 0.87 to 1.63 mm. GTR showed a significant benefit when compared to open flap debridement with relative risk 0.56 (95% CI: 0.36 to 0.86), chi-square for heterogeneity 0.00 (P = 1) and 95% CI for publication bias was 0.36 to 0.86 mm. GTR showed a significant benefit when compared to open flap debridement with relative risk 0.56 (95% CI: 0.36 to 0.86), chi-square for heterogeneity 0.00 (P = 1) and 95% CI for publication bias was 0.36 to 0.86 mm. GTR showed a significant benefit when compared to open flap debridement with relative risk 0.56 (95% CI: 0.36 to 0.86), chi-square for heterogeneity 0.00 (P = 1) and 95% CI for publication bias was 0.36 to 0.86 mm.

GTR attachment gain compared to open flap debridement

Laurell et al. *J Periodontol* 1998: 2.7 mm
Uncontrolled and unblinded studies

Cortellini et al. *Periodontology* 2000 2000: 1.6 mm
Unclear selection criteria for studies
Inclusion of studies of short duration

Needleman et al. *Cochrane Review* 2001: 1.1 mm
Randomised, controlled trials
Trials only comparing GTR vs flap debridement
Trials > 12 months
Furcation involvements excluded
Studies specifically treating early onset diseases excluded

1st. Pan-European IADR meeting, Cardiff, 25 September 2002

We have learned:

- Selection of studies to include in reviews will reflect conclusions
- Study methodology aspects will reflect conclusions
- Need to focus on better methodological design of studies

16

1st. Pan-European IADR meeting, Cardiff, 25 September 2002

Topics (n=236)

- Pain (n=51)
- Periodontology (n=31)
- Restorative dentistry (n=28)
- Caries (n=23)
- Fluorides (n=17)
- Orthodontics (n=16)
- Implant-based prosthetics (n=11)
- Antibiotics, acupuncture, apnea, infection control, oral medicine, sealants, sedation, treatment decisions, toxicology, TMD...

The Longevity of Dental Restorations
A Systematic Review

REPORT 19

Restorative Dentistry

1st. Pan-European IADR meeting, Cardiff, 25 September 2002

Topics (n=236)

- Pain (n=51)
- Periodontology (n=31)
- Restorative dentistry (n=28)
- Caries (n=23)
- Fluorides (n=17)
- Orthodontics (n=16)
- Implant-based prosthetics (n=11)
- Antibiotics, acupuncture, apnea, infection control, oral medicine, sealants, sedation, treatment decisions, toxicology, TMD...

Diagnosis and Management
of Dental Caries Throughout
Life

March 20, 2001
Page 10, 26 of 1

Dental caries

18

1st. Pan-European IADR meeting, Cardiff, 25 September 2002

The most relevant outcome criteria?

- Plaque, marginal bleeding, probing pocket depth, probing attachment level, radiographic marginal bone level, bone changes on standardised intra-oral radiographs....
- Implant mobility and implant removal of stable implants dictated by progressive marginal bone loss
- Implant fracture and other mechanical complications

22

1st. Pan-European IADR meeting, Cardiff, 25 September 2002

The most relevant outcome criteria?

Perceived/self reported:	Observed:
<ul style="list-style-type: none"> • Adaptation to prosthesis (satisfaction) • Appearance • Function (chewing, speech) • Dietary significance (intake, selection) • Health • Quality of life (psyche, well-being, self esteem) • Social activity 	<ul style="list-style-type: none"> • Appearance • Function (bite force, tracking) • Diet survey • Health indices • HRQL indices • Social activity

23

1st. Pan-European IADR meeting, Cardiff, 25 September 2002

We have learned:

Need to define the most relevant criteria for treatment outcomes when implant based prostheses are compared to alternative treatments

24

1st. Pan-European IADR meeting, Cardiff, 25 September 2002

Topics (n=236)

- Pain (n=51)
- Periodontology (n=31)
- Restorative dentistry (n=28)
- Caries (n=23)
- Fluorides (n=17)
- Orthodontics (n=16)
- Implant-based prosthetics (n=11)
- Antibiotics, acupuncture, apnea, infection control, oral medicine, sealants, sedation, treatment decisions, toxicology, TMD...

Impacted third molars

25

1st. Pan-European IADR meeting, Cardiff, 25 September 2002

26

Dentists' decisions on prophylactic removal of mandibular third molars: a 10-year follow-up study

Conclusion: In the decisions on prophylactic removal of mandibular third molars, there has been no change over the last 10 years towards a more non-interventionist attitude. Thus, the dentists seem not to have been influenced by the evidence that this intervention is not cost-effective.

27 molars on the first occasion and between 11 and 25 molars on the second occasion. Conclusion: In the decisions on prophylactic removal of mandibular third molars, there has been no change over the last 10 years towards a more non-interventionist attitude. Thus, the dentists seem not to have been influenced by the evidence that this intervention is not cost-effective.

26 • +44 (0) 208071 5000 ext. • +44 (0) 20870 6000 Fax: +44 (0) 20870 6000 e-mail: koren@communitydent.com Published 19 November 2000, accepted 8 November 2000

We have learned:

Systematic reviews and guidelines are not necessarily known to the community of dental practitioners.

Who's responsibility is it to disseminate new research findings and make sure they are implemented?

28

1st. Pan-European IADR meeting, Cardiff, 25 September 2002

FDI World Dental Federation - Dental resources online page - Microsoft Internet Explorer

Address: http://www.fdiworldental.org/online/index.htm

The FDI Organisation | FDI World Dental Federation | Global Dental Act & Act Organisation | The Dental Industry

FDI Members | FDI Congress, Education & Events Calendar | Global Dental Information | Professional Resources

Site search, profession resources

Search

Professional Resources

Public health issues
Procedures in the dental office
Materials, techniques & procedures
Specialised procedures
Education & Scientific issues
Dentists' world

www.fdiworldental.org

Topics (n=236)

- Pain (n=51)
- Periodontology (n=31)
- Restorative dentistry (n=28)
- Caries (n=23)
- Fluorides (n=17)
- Orthodontics (n=16)
- Implant-based prosthetics (n=11)
- Antibiotics, acupuncture, apnea, infection control, oral medicine, sealants, sedation, treatment decisions, toxicology **TMD**

Temporomandibular dysfunction

30

1st. Pan-European IADR meeting, Cardiff, 25 September 2002

TMD – not a new affliction

- 1840, Evens, articulator
- 1896, Walker, complex articulator--->gnathology
- 1899, Snow, face bow
- 1952, Shore, equilibration
- 1877, Kingsley, splint
- 1881, Goodwillie, pivot appliance
- 1960, Gelb, MORA splint
- 1887, Annandale, surgical repositioning
- 1909, Lantz, removal of discus
- 1918, Prentiss, "pressure atrophy"
- 1934, Costen, "overclosure" --> vertical dimension
- 1959, Schwartz, emotional tension

31

1st. Pan-European IADR meeting, Cardiff, 25 September 2002

TMD - 1996 consensus?

1996: 507 published reviews

- How common and how big is the problem?
- What is the etiology of TMD?
- What is the reliability of different diagnostic tests?
- What is the natural history of TMD?
- Which specific TMD treatment is superior and can be supported?
- Should/can TMD be prevented?

32

1st. Pan-European IADR meeting, Cardiff, 25 September 2002

NIH Technology Assessment Conference on TMD. 29.4 - 1.5.1996

Rationale for addressing the issue:

- Concern about the safety and efficacy of the care provided to patients with TMD(!)
- Absence of clear, valid, and reliable guidelines for diagnosis
- Dearth of proven rationales for a full range of treatment methods
- Many may attempt therapy with approaches that have not been adequately tested in scientifically based research studies

33

1st. Pan-European IADR meeting, Cardiff, 25 September 2002

We have learned:

(NIDCR/NIH 1996:) A need to focus on:

- valid diagnostic criteria
- valid treatment outcomes
- reliable methods to appraise a and b
- better methodological design of studies

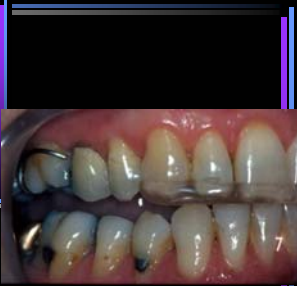
Empirical clinical experience is inadequate evidence of management efficacy in spite of being numerous

34

1st. Pan-European IADR meeting, Cardiff, 25 September 2002

Topics (n=236)

- Pain (n=51)
- Periodontology (n=31)
- Restorative dentistry (n=28)
- Caries (n=23)
- Fluorides (n=17)
- Orthodontics (n=16)
- Implant-based prosthetics (n=11)
- Antibiotics, acupuncture, apnea, infection control, oral medicine, sealants, sedation, treatment decisions, toxicology [TMD] . . .



Splints

35

1st. Pan-European IADR meeting, Cardiff, 25 September 2002

Abstracts in Oral Biology & Medicine

critical reviews

content delivery

HOME HELP FEEDBACK SUBSCRIPTIONS ARCHIVE SEARCH TABLE OF CONTENTS

Destination: IADR ORAL BIOLOGY & MEDICINE | Log In as Member | Contact Us | Site Map

Critical Reviews in Oral Biology & Medicine, Vol 9, 345-361, Copyright © 1998 by International & American Association for Dental Research

ARTICLES

Oral splints: the crutches for temporomandibular disorders and bruxism?

T. T. Dui and G. J. Lorange

Faculty of Dentistry, University of Toronto, Ontario, Canada

Despite the extensive use of oral splints in the treatment of temporomandibular disorders (TMD) and bruxism, their mechanisms of action remain controversial. Various hypotheses have been proposed to explain their apparent efficacy (i.e., low therapeutic value), including the repositioning of condyle and/or the articular disc, reduction in the electromyographic activity of the masticatory muscles, modification of the patient's "habitual" oral behavior, and changes in the patient's occlusion. Following a comprehensive review of the literature, it is concluded that any of these theories is either false or inaccurate, while the issue of low efficacy for oral splints remains unsettled. However, the results of a controlled clinical trial lend support to the effectiveness (i.e., the patient's appreciation of the positive changes which are perceived to have occurred) during the trial of the stabilizing splint in the control of myofascial pain. In light of the data supporting their effectiveness but not their efficacy, oral splints should be used as an adjunct for pain management rather than a definitive treatment. For sleep bruxism, it is prudent to limit their use as a habit management aid and to prevent/limit dental damage potentially induced by the disorder. Future research should study the natural history and etiology of TMD and bruxism, so that specific treatments for these disorders can be developed.

199 refs

Copyright © 1998 by the International & American Association for Dental Research.

Systematic reviews are not necessarily true or of relevance, but they may be repeatable

40

1st. Pan-European IADR meeting, Cardiff, 25 September 2002

Systematic Reviews & Meta-analyses – in sum:

SHIT IN
SHIT OUT

41

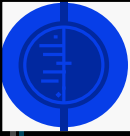
1st. Pan-European IADR meeting, Cardiff, 25 September 2002

Dangers of systematic reviews and meta-analysis

- Publication bias
 - Unpublished data
 - Covert duplicate publications
 - Limitation to positive findings
- Language bias
- Funding bias
- Study quality bias
- Retrieval bias – they remain “observational studies”

42

1st. Pan-European IADR meeting, Cardiff, 25 September 2002



Cochrane Oral Health Group

- 250 members from 25 countries
- Specialist trials register ~14,000 entries
- Systematic reviews: near 90
- OHG offers help to complete reviews

Contact: Emma.Tavender@man.ac.uk

<http://www.cochrane-oral.man.ac.uk>



Thank you
for your
kind
attention
