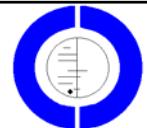


Evidence-based medicine

-

Utfordringer i kariologi

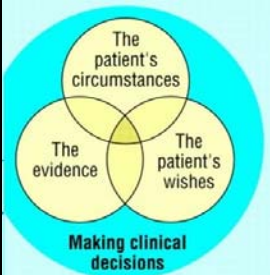
22/11/2004 Asbjørn Jokstad

Evidence Based Medicine 

The aim of evidence-based medicine is to eliminate the use of ineffective, expensive, or even dangerous medical decision-making
(Rosenberg & Donald, BMJ, 1995)

2

Hvor praktiseres EBM?

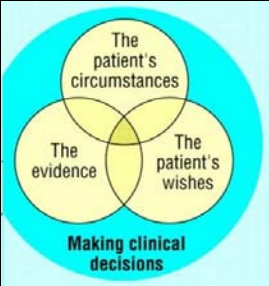


1. Hvordan skal jeg løse mine daglige kliniske problemstillinger?
- et praktisk spørsmål

2. Hvordan kan jeg være rimelig sikker på at det jeg anbefaler og utfører er den beste behandlingen min pasient kan motta?
- et etisk spørsmål

Svar: I behandlings-situasjoner 3


Hvor praktiseres EBM?



1. Hvordan skal jeg løse mine daglige kliniske problemstillinger?
- et praktisk spørgsmål

2. Hvordan kan jeg være rimelig sikker på at det jeg underviser som lærer ved en undervisningsinstitution er det mest korrekte?
- et etisk spørgsmål

4



Evidence Based Medicine

Evidence-based medicine is the conscientious, explicit and judicious use of current best evidence in making decisions about the care of individual patients.

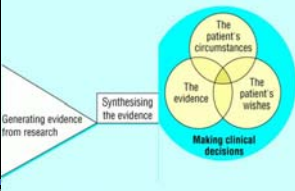
Its practice requires the integration of best available external clinical evidence with individual clinical expertise

5

Evidence Based Medicine

"The conscientious, explicit and judicious use of current best evidence in making decisions about the care of individual patients."

Its practice requires the integration of best available external clinical evidence (from systematic research) with individual clinical expertise



Hvor befinner du deg vitenskapsfilosofisk?

Diskusjonsnivå	Filosofisk standpunkt	
Ontologisk (hva vet vi?- hva er?)	Realist	Anti-realist Postmodernist?
Epistemologisk (hva kan vi vite?- hvordan kan vi vite?)	Rasjonalist	Empirist

7

Hvordan praktiseres EBM?

1. Generere konkrete kliniske problemstillinger
Spørsmål om terapi, prognose og bivirkninger
2. Mest mulig effektivt finne evidens
 - Søkning i databaser: teknikker og muligheter
 - Identifisere kliniske studier som er relevante
3. Bedømme validitet, resultat og anvendelighet
4. Anvende best evidens i daglig praksis

8

Hvordan praktisere EBM?

1. Generere konkrete kliniske problemstillinger
Spørsmål om terapi, prognose og bivirkninger

9

Hva vil jeg anbefale? ..eller..
Er det konsensus om det optimale valg av:

Karies - Forebygging

1. Alternative fluortilførsler?
2. Vannfluoridering?
3. Hvilket munnskyllevann?
4. Hvor lenge skal vi pusse tennene? ... og med hva?
5. Verdien av fissurforsgling?
6. Verdi/innhold i fob veiledning om diett/munnhygienetiltak?

Kariesetiologi
Relevans av kaosteorier?
Drikkevaner?

Kariesdiagnostikk
Klinisk kriterier?
Diagnodent?

Kariesprognose
Kariesprediksjonsverdi?
E.g. GC/Ivoclar

Kariesterapi
Holdbarhet?
Nye teknologier
Ozon?
Carisolv?
9.(?) generasjon bond?

Forebygging, Diagnostikk, Prognose & Terapi av
Dentinsensitivitet?
Tannerosjoner?

10

Hvordan praktisere EBM?

1. Generere konkrete kliniske problemstillinger
Spørsmål om terapi, prognose og bivirkninger
2. Mest mulig effektivt finne evidens
 - Søkning i databaser: teknikker og muligheter
 - Identifisere kliniske studier som er relevante

11

Selv om man kan betegne seg som en faglig dyktig tannlege er det til enhver tid en stor mengde ny informasjon innenfor odontologi som vi er ukjente med.

12

Informasjonseksplasjon

Enorm vekst av vitenskapelige publikasjoner i biomedisin - inkludert i odontologi

1. Antallet helsepersonnel og forskere stiger og

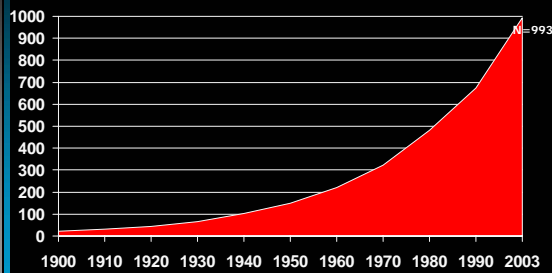
Antall publikasjoner er nøkkel til penger og ære

2. Antall publikasjoner fordoblet hvert 10. år

3. Antall tidsskrift øker kontinuerlig

15

Odontologiske fagtidsskrift



Kilde: Ulrich's International Periodicals Directory

Hvem står bak denne flommen av ny informasjon innen odontologi?

15

The clinical practitioners



- Single handed GPs/ specialists in teams; secondary/tertiary care
- Great diversity of experience, interest and capacity
- Draw on a panoply of experience
- Pragmatism: what works - what creates problems

16

The researchers



- Creates "scientific evidence"
- Formulation of ideas, hypotheses, study design, data collection
- Peer review, internal/external validity, debates within paradigms
- Report findings in probabilities, not absolutes

17

The appraisers of evidence for clinical practice



- Epidemiologists, health economists, statisticians, social scientists, and clinicians
- Collect, abstract and appraise practice related knowledge
- Debates about value and balance between consensus and evidence, rigour of data and application of statistics

18

Developers of local guidelines and protocols



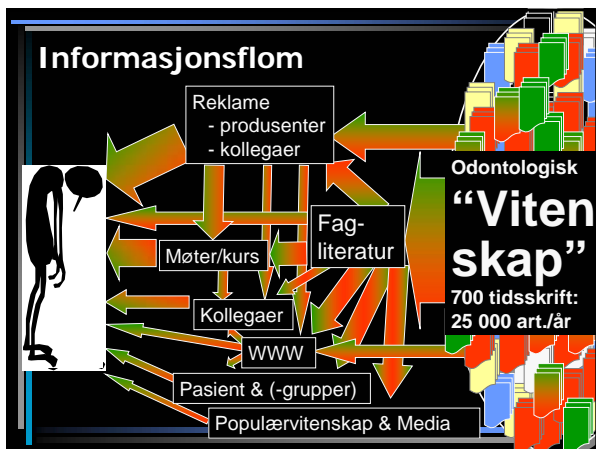
- Local consensus, sometimes on national guidelines
- Clinical specialists seeking ways to influence peers

19

A rapidly changing society

- The production of new knowledge is at maximum in historical context
- Incessant replacements of established ideas and concepts

20



Evidens basert medisin - strategi

Hvordan vi skal forholde oss til kontinuerlige forandringer . . .

...uten at vi noengang får vite det riktige svaret

22

Vi må ikke bare ta stilling til

mengden av informasjon vi mottar

men også

kvaliteten på denne informasjonen.

23

Where search for scientific information on cardiology research?

1. FDI Guidelines Database
2. Cochrane Library
3. ISI Web of Knowledge
4. Medline
 1. Pubmed
 2. Ovid
5. Other databases

24

Hvordan praktisere EBM?

1. Generere konkrete kliniske problemstillinger
Spørsmål om terapi, prognose og bivirkninger
2. Mest mulig effektivt finne evidens
 - Søkning i databaser: teknikker og muligheter
 - Identifisere kliniske studier som er relevante
3. Bedømme validitet, resultat og anvendelighet

28

Tre hovedspørsmål

1. Er studien gyldig (valid)?
2. Hva er resultatene ?
3. Er resultatene relevante for mitt problem?

29

1 Er studien gyldig (valid)?

- Er problemstillingen klar?
- Benyttes det en hensiktsmessig studiedesign for å besvare problemstillingen?
- Ble studien utført reliably?
- Kan du følge hva forfatterne gjorde?

30

Studiedesign på kliniske studier og terminologi

= Babelsk forvirring?

analytical study	ecological study	prospective cohort study
case control study (89)	etiologi study	prospective follow-up study,
case serie	experimental study	observational or experimental
case study, case report	explorative study	prospective study (67)
cause-effect study	feasability study (79)	quasi-experimental study
clinical trial (79)	follow-up study (67)	randomized clinical trial, RTC
cohort study (89)	historical cohort study	randomized controlled trial,
cohort study with historical	incidence study	RCT (89)
controls	intervention study	retrospective cohort study
controlled clinical trial (95)	longitudinal study (79)	retrospective follow-up study
cross-sectional study (89)	N=1 trial	retrospective study (67)
descriptive study	non-randomized trial with	surveillance study
diagnostic meta-analysis	contemporaneous controles	survey, descriptive survey
diagnostic study	non-randomized trial with	therapeutic meta-analysis
double blind randomized	historical controles	trohoc study
therapeutical trial with cross-	observational study	
over design	prevalence study	

Kliniske studier og design (Medline termer):

- (Kasuspresentasjon/kasusserie)
- Tverrsnittsstudie
- Kasus-kontrollstudie
- Kohortstudie
- Randomisert kontrollert studie

32

Kritisk analyse av studier - kriterier

- Finnes for:
 - behandlingsvalg
 - terapi
 - diagnose
 - screening
 - prognose
 - kausalstudier
 - kvalitetsevaluering
 - økonomiske analyser

33

Eksempel: Terapeutisk effektivitet - sammenheng mellom studiedesign og bevisstyrke?

22/11/2004

34

Bevisstyrke på terapeutisk effektivitet

US Agency of Health Care Policy & Research, 1992

- Ia. Meta-analysis of randomized controlled trials
- Ib. At least one randomized controlled trial
- IIa. At least one well-designed controlled study without randomization
- IIb. At least one other quasi-experimental study
- III. Well-designed non-experimental descriptive studies, such as comparative studies, correlation studies and case-control studies.
- IV. Expert committee reports or opinions and/or clinical experience of respected authorities

EBM Working Group, McMaster University 1993

- Systematic reviews and meta-analyses
- RCT with definite results (ie. result with CI that do not overlap the threshold clinically significant effect)
- RCT with non-definite results (ie. a point estimate that suggests a clinically significant effect, but with CI overlapping the threshold for this effect)
- Cohort studies
- Case-control studies
- Cross sectional studies
- Case reports

Bevisstyrke på terapeutisk effektivitet

Richards & Lawrence, Br Dent J 1995;175:270

- at least one published systematic review of multiple well designed randomised controlled trials
- at least one published properly designed randomised controlled trial of appropriate size and in an appropriate clinical setting
- published well-designed trials without randomisation, single group pre-post, cohort, time series or matched case controlled studies
- well-designed experimental studies from more than one centre or research group
- opinions of respected authorities based on clinical evidence, descriptive studies or reports of expert consensus committees

Sackett et al., Editorial. EBM 1995;1:4

- (I-1) Based on 2 or more well designed randomised controlled trials (RCT), meta-analyses, or systematic reviews.
- (I-2) Based on a RCT.
- (II-1) Based on a cohort study.
- (II-2) Based on a case controlled study.
- (II-3) Based on a dramatic uncontrolled experiment.
- (III) respected authorities, expert committees (consensus)etc.
- (IV) ...someone once told me

Bevisstyrke på terapeutisk effektivitet
CEBM, 1999. (<http://cebm.jr2.ox.ac.uk/docs/levels.html>)

- 1a. Systematic review (with homogeneity of RCTs)
- 1b. Individual RCT (with narrow confidence interval)
- 1c. All or none
- 2a. Systematic review (with homogeneity) of cohort studies
- 2b. Individual cohort study (and low quality RCT; e.g., <80% follow-up)
- 2c. "Outcomes" research
- 3a. Systematic review (with homogeneity) of case-control studies
- 3b. Individual case-control study
4. Case-series (and poor quality cohort and case-control studies)
5. Expert opinion without explicit critical appraisal, or based on physiology, bench research or "first principles"

2. Hva er resultatene ?

- Er resultatene presentert på en klar og enkel måte?
- Er det en klar konklusjon?
- Er konklusjonen viktig klinisk?

38

3. Er resultatene relevante for mitt problem?

- Er deltakerne tilnærmet like mine egne?
- Er det realistisk at jeg kan utføre behandlingen på mine pasienter?

39


Hvordan praktisere EBM?

1. Generere konkrete kliniske problemstillinger
 - Spørsmål om terapi, prognose og bivirkninger
2. Mest mulig effektivt finne evidens
 - Søkning i databaser: teknikker og muligheter
 - Identifisere kliniske studier som er relevante
3. Bedømme validitet, resultat og anvendelighet
4. Anvende best evidens i daglig praksis

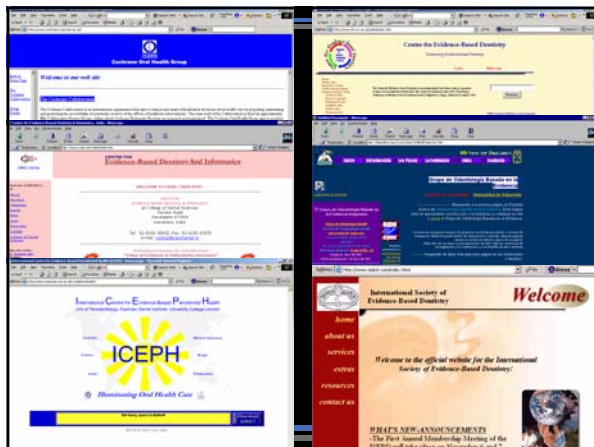
40

Hvordan utøve evidens-basert praksis?

1. Lære selv hvordan evidens-basert odontologi utføres
 - Bøker
 - Seminarer
 - Internett
 - Online link-lister
 - Online kurs
 - Online ressurser

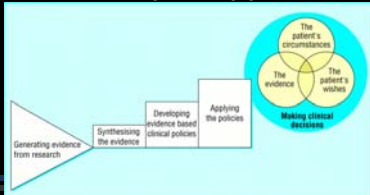


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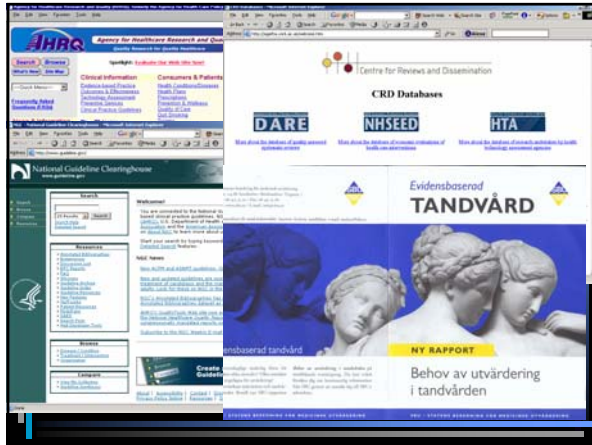


Hvordan utøve evidens-basert praksis?

3. Akseptere og anvende kliniske retningslinjer som er baserte på evidens-baserte prinsipper



46



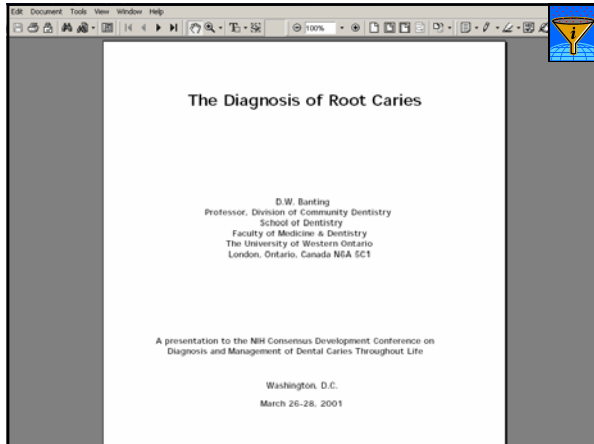
KARIES – Forebygging

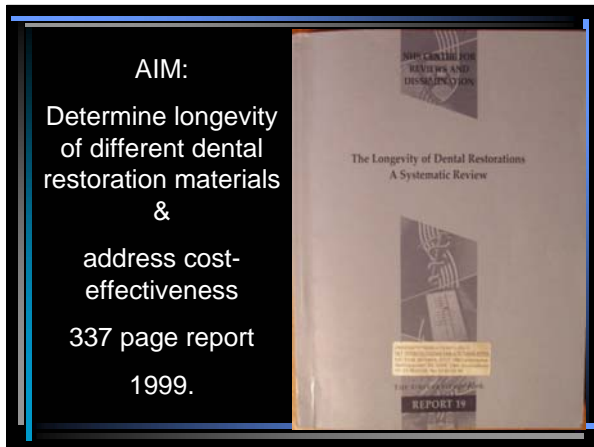
1. Diett?
2. Alternative fluorbehandlinger?
3. Vannfluoridering?
4. Hvilket munnskyllevann?
5. Hvor lenge skal vi pusse tennene? ... og med hva?
6. Verdien av fissurforsgling?
7. Betydningen av oligomerer?
8. Betydningen av tannforebyggende tiltak generelt?

Sverige
Skotland
USA

Populasjonsnivå?
Individnivå?

48





14000 papers -> 5675 studies

Wheeler study design	Outcome measure code number	Metal indirect restorations			Nonmetal indirect restorations		
		Restoration replacement (subjective opinion)	Restoration type of crown (but no tracings)	Restoration replacement (use of any criteria, tracing and/or radiation, include USPHS where not the examinee's self)	Restoration replacement (radii outcome, criteria, tracing and radiation, include USPHS where appropriate)	Restoration Failure (radiol previous intervention)	Restoration
Outcome measure code USPHS	1	X	X	X	X	X	X
Descriptive studies / Reports of expert studies / Reports of expert Opinions	2	X	X	X	X	X	X
Case studies	3	X	X	X	X	X	X
Retrospective case series	4	X	X	X	X	X	X
Prospective case series	5	X	X	X	X	X	X
Retrospective study with concurrent controls	6	X	X	X	X	X	X
Retrospective study with historical controls	7	X	X	X	X	X	X
Retrospective study with concurrent controls	8	X	X	X	X	X	X
Other controlled trial	9	X	X	X	X	X	X
Blinded designed randomized controlled trial	10	X	X	X	X	X	X

652 studies
↓
253 studies
↓
195 studies

X indicates that studies so classified were excluded from the review.
I indicates that studies so classified were included in the review if it was possible to extract the necessary data.

60

Journal of Dentistry 29 (2001) 155–161
www.elsevier.com/locate/jdent

Challenges with studies investigating longevity of dental restorations— a critique of a systematic review

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Abstract
Objectives: A systematic review is a method of evaluating the published and unpublished literature relating to a specific area or topic. The objectives of this paper are to identify and discuss problems encountered in synthesising the available literature; and to make recommendations for the future conduct and reporting of clinical trials that aim to determine the longevity of dental restorations.
Data sources: Studies were identified by a wide search of published and unpublished material in any language using a large number of general and specialist data bases, hand searching of key dental journals and searching of abstracts from conference proceedings.
Study selection: Pre-defined inclusion criteria based on objective outcome measures of restoration longevity and study designs were applied to determine study selection.
Conclusions: A review of the longevity of dental restorations completed recently encountered substantial problems in designing an appropriate protocol to address this issue. The review found that many of the factors reported previously as affecting restoration longevity could not be confirmed using the agreed systematic review protocol that incorporated an objective study design. Further, the multiplicity of study designs, and reporting methods found in the literature made meta-analysis impossible. A proforma is proposed in order to aid the design of future research into the longevity of restorations. © 2001 Elsevier Science Ltd. All rights reserved.

Author and reference	A	B	C	D	E	F	G	H	I
Hamilton et al. (1983) ¹⁷	1	✓	✓	✓	✓	✓	✓	✓	✓ (10)
Handelski et al. (1985) ¹⁸	1	✓	✓	✓	✓	✓	✓	✓	✓ (10)
Wilson et al. (1996) ²⁷	1	✓	✓	✓	✓	✓	✓	✓	✓ (10)
Walbury et al. (1996) ²⁸	2	✓	✓	✓	✓	✓	✓	✓	✓ (10)
Wilson & Newman (1991) ³⁶	2	✓	✓	✓	✓	✓	✓	✓	✓ (10)
Alkerboom et al. (1993) ¹	3	✓	✓	✓	✓	✓	✓	✓	✓ (8)
Downes (1984) ²	4	✓	✓	✓	✓	✓	✓	✓	✓ (8)
Elkimon (1983) ¹²	4	✓	✓	✓	✓	✓	✓	✓	✓ (8)
Jakstad & Mjor (1991) ²¹	4	✓	✓	✓	✓	✓	✓	✓	✓ (8)
Mjor & Jakstad (1993) ²¹	4	✓	✓	✓	✓	✓	✓	✓	✓ (8)
Narboe et al. (1998) ³⁸	4	✓	✓	✓	✓	✓	✓	✓	✓ (8)
Osborne & Newman (1990) ⁴⁰	4	✓	✓	✓	✓	✓	✓	✓	✓ (9)
Osborne et al. (1991) ⁴¹	4	✓	✓	✓	✓	✓	✓	✓	✓ (9)
Smiles (1991) ³⁰	4	✓	✓	✓	✓	✓	✓	✓	✓ (9)
Van Dijken (1991) ³³	4	✓	✓	✓	✓	✓	✓	✓	✓ (9)
Allen (1977) ⁷	5	✓	✓	✓	✓	✓	✓	✓	✓ (8)
Bentley & Drake (1986) ⁷	5	✓	✓	✓	✓	✓	✓	✓	✓ (8)
Spejvers & Smit (1990) ⁴	5	✓	✓	✓	✓	✓	✓	✓	✓ (8)
Crabb (1981) ⁸	5	✓	✓	✓	✓	✓	✓	✓	✓ (10)
Dawson & Smiles (1992) ⁶	5	✓	✓	✓	✓	✓	✓	✓	✓ (8)
Dawson & Smiles (1992) ⁷	5	✓	✓	✓	✓	✓	✓	✓	✓ (8)
Drake (1988) ¹⁰	5	✓	✓	✓	✓	✓	✓	✓	✓ (8)
Gray (1976) ¹⁵	5	✓	✓	✓	✓	✓	✓	✓	✓ (8)
Hayakawa & Smiles (1997) ¹⁸	5	✓	✓	✓	✓	✓	✓	✓	✓ (8)
Hume (1985) ²⁰	5	✓	✓	✓	✓	✓	✓	✓	✓ (10)
Lovelle (1976) ²⁴	5	✓	✓	✓	✓	✓	✓	✓	✓ (8)
Lattaf et al. (1997) ²⁶	5	✓	✓	✓	✓	✓	✓	✓	✓ (10)
Lattaf et al. (1999) ²⁵	5	✓	✓	✓	✓	✓	✓	✓	✓ (10)
Muhammad & Smiles (1994) ²⁷	5	✓	✓	✓	✓	✓	✓	✓	✓ (8)
Mayhew (1995) ²⁹	5	✓	✓	✓	✓	✓	✓	✓	✓ (8)
Paterson (1984) ²⁵	5	✓	✓	✓	✓	✓	✓	✓	✓ (8)
Robbins & Summitt (1988) ⁴⁷	5	✓	✓	✓	✓	✓	✓	✓	✓ (8)
Robinson (1971) ¹⁶	5	✓	✓	✓	✓	✓	✓	✓	✓ (8)
Smiles et al. (1991) ³¹	5	✓	✓	✓	✓	✓	✓	✓	✓ (8)
Smiles (1991) ³²	5	✓	✓	✓	✓	✓	✓	✓	✓ (8)
Wells et al. (1985) ³⁴	5	✓	✓	✓	✓	✓	✓	✓	✓ (8)
Meuwissen (1985) ³⁰	5	✓	✓	✓	✓	✓	✓	✓	✓ (10)
Burke et al. (1998) ⁷	6	✓	✓	✓	✓	✓	✓	✓	✓ (8)
Ford et al. (1994) ¹⁴	6	✓	✓	✓	✓	✓	✓	✓	✓ (8)
Ford et al. (1995) ¹⁵	6	✓	✓	✓	✓	✓	✓	✓	✓ (8)

Table 1 Criteria of assessment of validity and quality of studies for inclusion in the review

A Design type — hierarchical classification

Satisfactory investigations

- 1 Randomised controlled trials
- 2 Nonrandomised controlled trials
- 3 Longitudinal experimental clinical studies
- 4 Longitudinal prospective studies

Less satisfactory investigations

- 5 Longitudinal retrospective studies

Least satisfactory investigations

- 6 Cross-sectional studies
- 7 Reports consisting only of an abstract

B Was the study described as randomised? Yes/no

C Were the examiners calibrated? (studies with one or more assessors) Yes/no

D Were the terms 'failure' and 'survival' of restorations clearly defined? Yes/no

E Were the criteria for replacement clearly defined? Yes/no

F Were effect modifiers considered? Yes/no

G Was the assessment based on clinical examinations? Yes/no

H Was the effect of censoring data considered? Yes/no

I Appropriate outcome measure used? Yes/no

- 8 Median survival time (MST) or median longevity
- 9 Cumulative survival rate
- 10 Survival/failure rate

REVIEW
How long do routine dental restorations last?
A systematic review

H. A. Davies¹, H. A. Ait², R. Smith³, D. R. Miles⁴, F. A. J. Smith⁵, J. A. Smith⁶

Objective To conduct a systematic review of the literature on the longevity of routine dental restorations in permanent posterior teeth, and to identify and examine factors influencing its variability.

Method Accepted guidelines were followed. An advisory group oversaw the project. Simple Class I and Class II amalgam, composite resin, glass ionomer and cast gold restorations were covered. Comprehensive searching of electronic databases, hand searching, and location of 'grey' literature, generated 124 research reports. Those considered relevant were assessed for validity and quality according to agreed criteria. The analysis was descriptive.

Results Eight of 38 relevant research reports were categorised, according to agreed criteria, as being of satisfactory validity and quality. They suggested that 50% of all restorations last 10 to 20 years, although both higher and lower median survival times were reported. The findings were supported by the totality of studies reviewed. However, variability was substantial. Restoration type, materials, the patient, the operator, the practice environment and type of care system appeared to influence longevity.

Conclusions Many studies were imperfect in design. Those considered to be the most appropriate for analysis were too limited to undertake a formal statistical exploration. Therefore there remains a need for definitive randomised controlled trials of restoration longevity, of sound design and adequate power, employing standardised assessments and appropriate methods of analysis.

Kanskje kan
dette nye
"EBM" hjelpe
meg?



67
