



Dental Implant Therapy - Trends & Literature Critical Appraisal

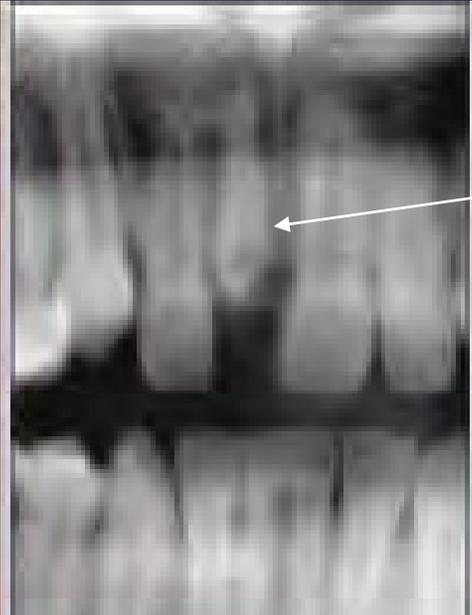
American Academy Of Fixed Prosthodontics
Annual Meeting February 23-24, 2007

Asbjørn Jokstad, DDS, PhD
Professor and Head, Prosthodontics
Faculty of Dentistry, University of Toronto





Adolescent patient with a crown–root fracture of central: options?



Fracture line palatally

1. Extraction → orthodontics → veneer or crown
2. Extraction → etch-bridge or FPD
3. Extraction → implant → abutment → crown
4. Extraction & replantation 180° → endo → crown
5. Endo → orthodontic extrusion → crown
6. Decoronation+etch-bridge/flipper → implant → abutment → crown



Adolescent patient with missing laterals: options?



- A. Orthodontic Treatment
- B. Etch-bridges
- C. (Provisional) Removable Partial
- D. Conventional Fixed Partial
- E. Implant-supported crowns



Adolescent patient with missing laterals: options?



A. Orthodontic Treatment

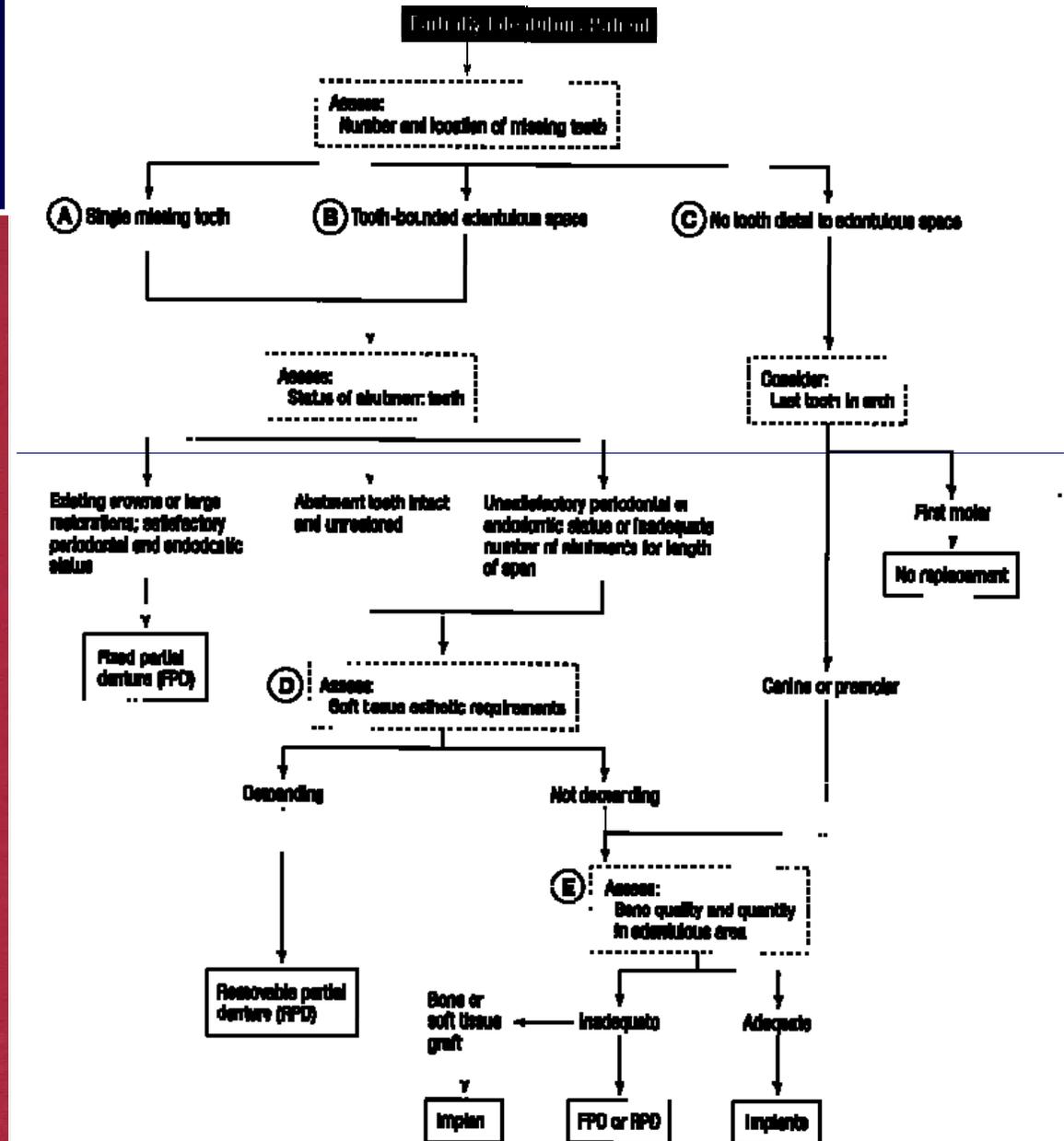
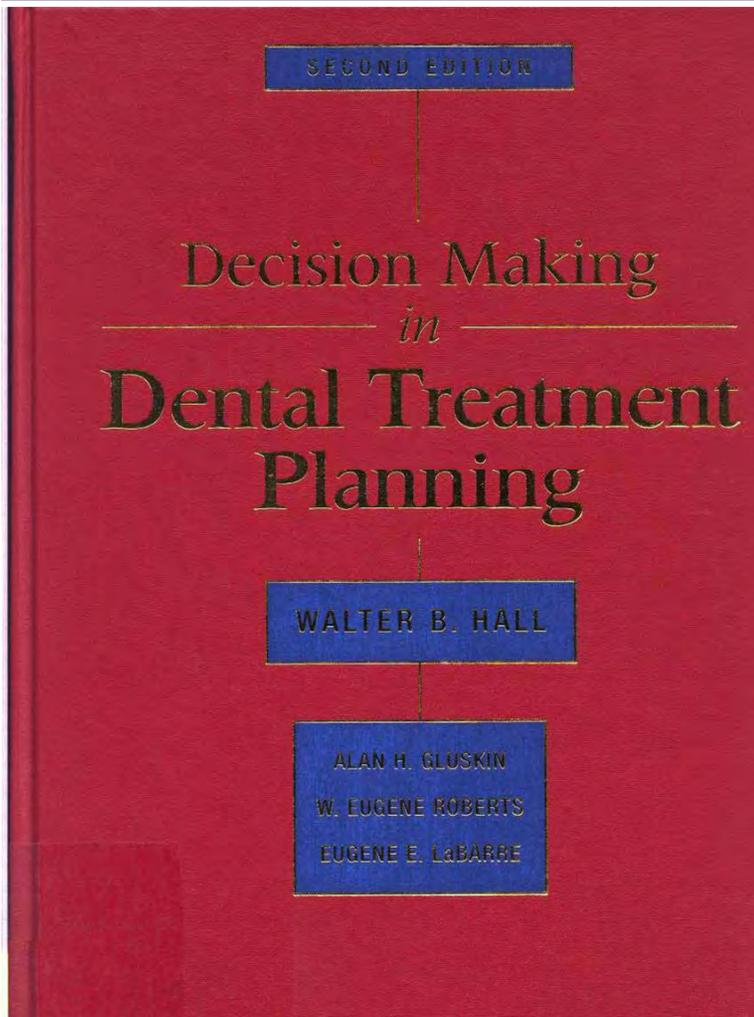
More treatment considerations:

What if buccal bone augmentation is required?

- A.** Single implants + crowns in the lateral regions
- B.** Mesial movement of canines → composites + single implants in canine region
- C.** Mesial movement of canines & bicuspids → composites + single implants in bicuspid region



Useful, or just cookbook?





“Medicine is a science of uncertainty and an art of probability”

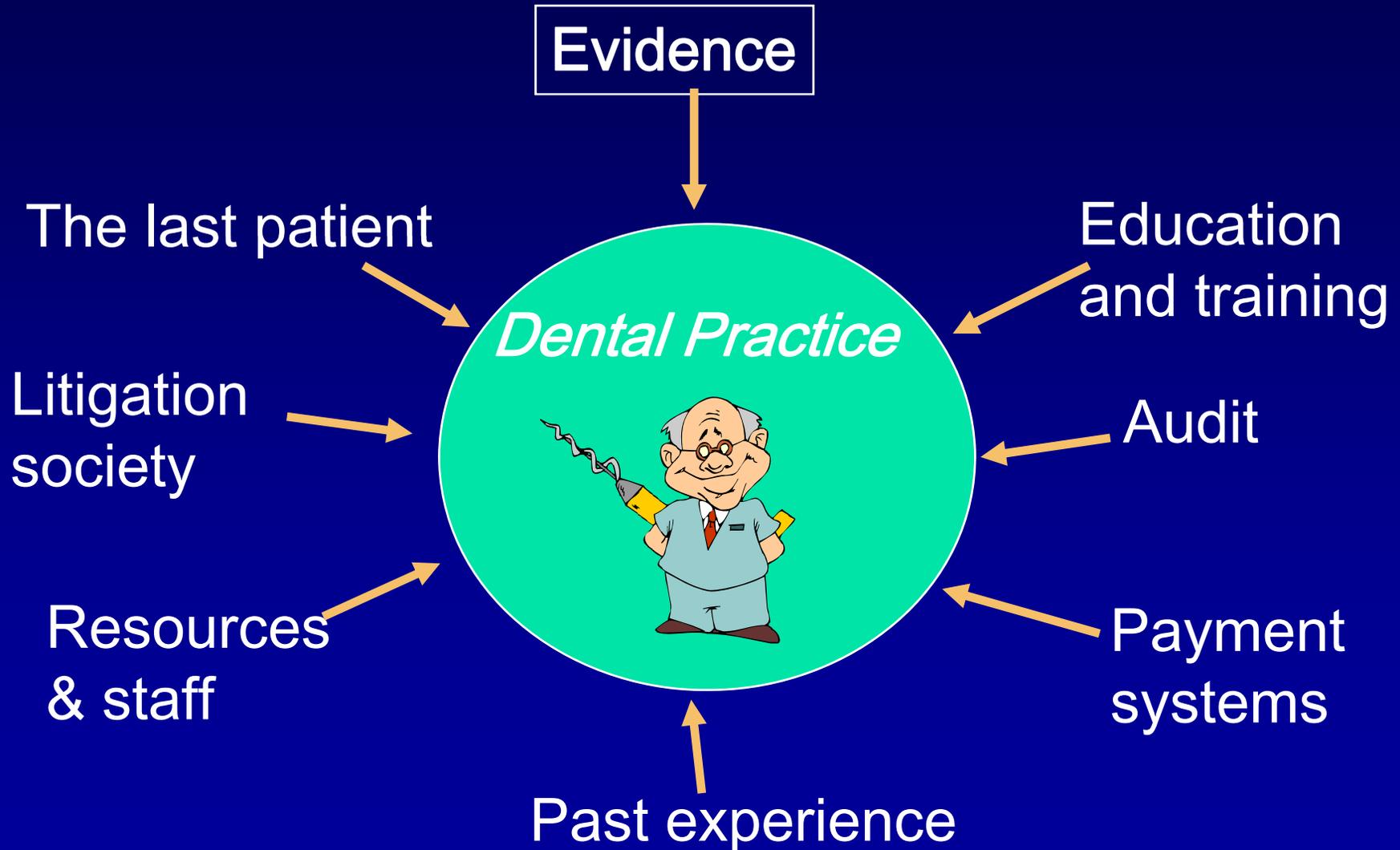


Sir William Osler

Canadian Physician (1849-1919)



What has been shown to influence our treatment decisions in practice?



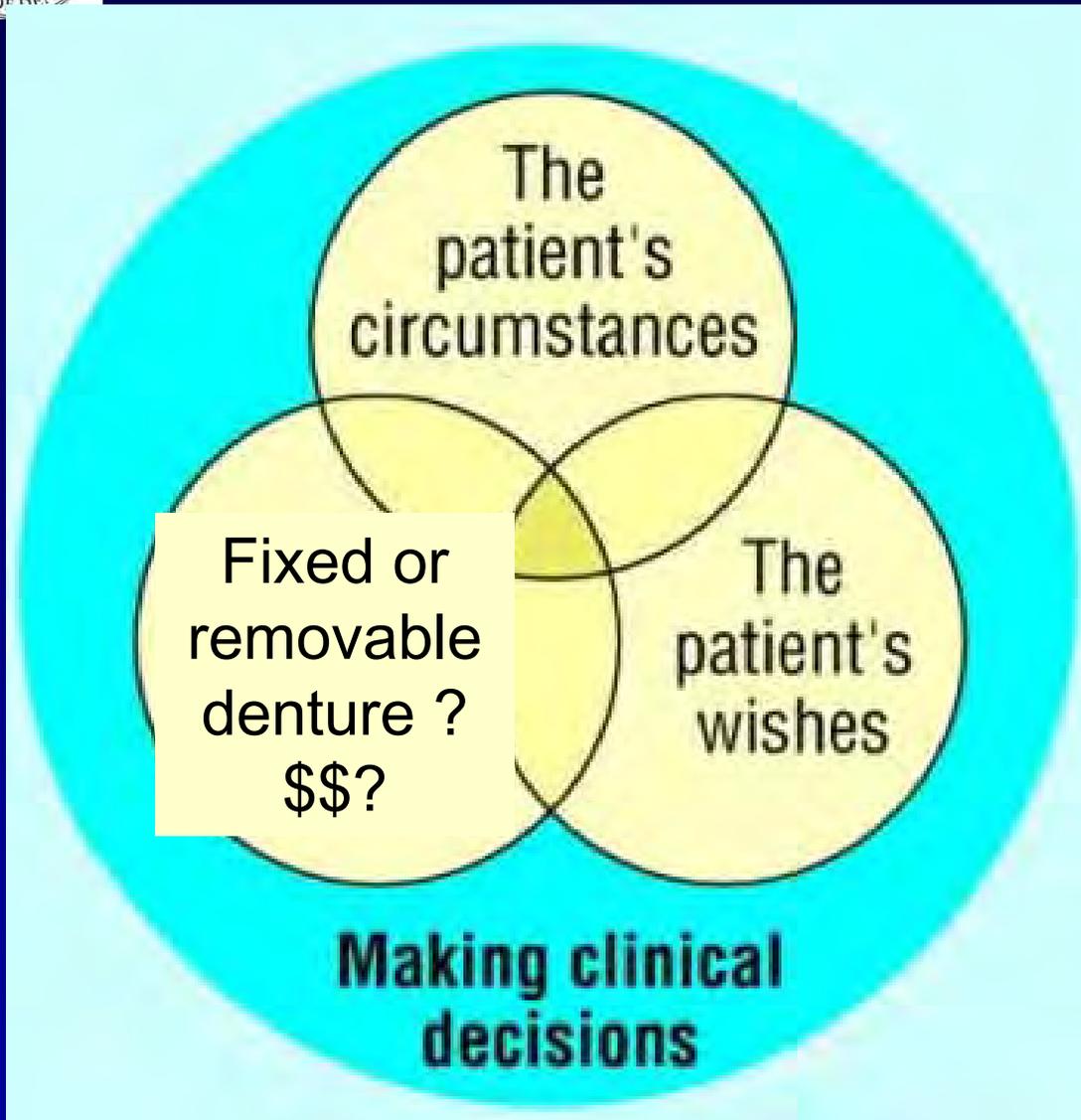


"A science of uncertainty and an art of probability"

Adopting an
evidence-based
clinical practice will
facilitate arriving at
appropriate treatment
decisions



"A science of uncertainty and an art of probability"
Decision making in prosthodontics



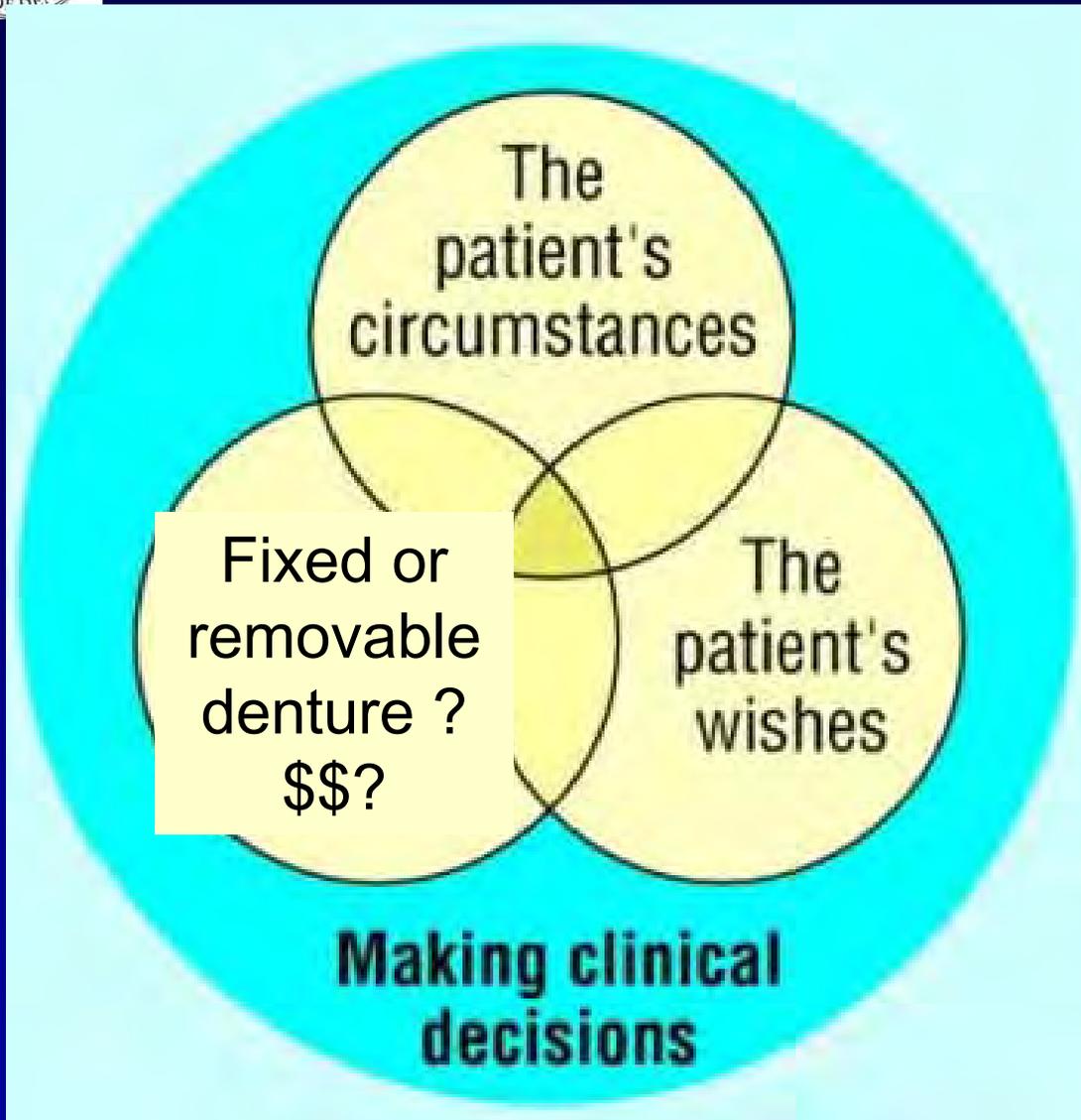
Historically, prosthodontic decision making has always been influenced by:

1. a narrow range of technical solutions (limited by biology) and
2. the patient finances.



"A science of uncertainty and an art of probability"

Decision making in prosthodontics



Traditional prosthodontic decision making is equivalent to

...

how evidence-based medicine is meant to be practiced

From: Haynes et al. Br Med J 1998; 317:273-6



"A science of uncertainty and an art of probability"

**Scientific studies are graded
according to the
theoretical possibility
of a
false conclusion**

**This is reflected by the
design of the study.**

...the correct conclusions will remain uncertain forever....



“A science of uncertainty and an art of probability”

“Doubt is not a pleasant condition, but certainty is an absurd one”



Voltaire

French Philosopher (1694-1778)



Clinical trial terminology - tower of Bable?

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



Clinical trial terminology - Medical Subject Headings (MESH) terms 1967

case serie

case study, case report

prospective study (67)

follow-up study (67)

retrospective study (67)



Clinical trial terminology - MESH terms 1979

case serie

case study, case report

clinical trial (79)

feasibility study (79)

follow-up study (67)

longitudinal study (79)

prospective study (67)

retrospective study (67)



Clinical trial terminology - MESH terms 1989

case control study (89)

case serie

case study, case report

clinical trial (79)

cohort study (89)

cross-sectional study (89)

feasibility study (79)

follow-up study (67)

longitudinal study (79)

prospective study (67)

randomized controlled trial, RCT (89)

retrospective study (67)



Clinical trial terminology - MESH terms 1995

case control study (89)

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longitudinal study (79)

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randomized controlled trial, RCT (89)

retrospective study (67)



Clinical trial terminology - tower of Bable → stick to the Medical Subject Headings terms

analytical study

case control study (89)

case serie

case study, case report

cause-effect study

clinical trial (79)

cohort study (89)

cohort study with historical controls

controlled clinical trial (95)

cross-sectional study (89)

descriptive study

diagnostic meta-analysis

diagnostic study

double blind randomized therapeutical trial with cross-over design

ecological study

etiological study

experimental study

explorative study

feasibility study (79)

follow-up study (67)

historical cohort study

incidence study

intervention study

longitudinal study (79)

N=1 trial

non-randomized trial with contemporaneous controls

non-randomized trial with

historical controls

observational study

prospective cohort study

prospective follow-up study, observational or experimental prospective study (67)

quasi-experimental study

randomized clinical trial, RTC

randomized controlled trial, RCT (89)

retrospective cohort study

retrospective follow-up study

retrospective study (67)

surveillance study

survey, descriptive survey

therapeutic meta-analysis

trohoc study



Clinical study designs (U.S. NLM Medical Subject Headings terms):

1. Randomised Controlled Trial
2. Controlled Clinical Trial
3. Cohort Study
4. Case-Control Study
5. Cross-Sectional Survey
6. Case study/ case series



“A science of uncertainty and an art of probability”

Study Designs and strengths

	RCT	CCT	Cohort	Case Control	Cross-sectional	Case series
Therapy / Prevention / Education	☆☆☆	☆☆	☆			
Prognosis	☆	☆	☆☆☆			
Diagnosis	☆☆	☆	☆			
Screening test	☆☆	☆	☆	☆		
Prevalence/ hypothesis generation					☆☆☆	☆

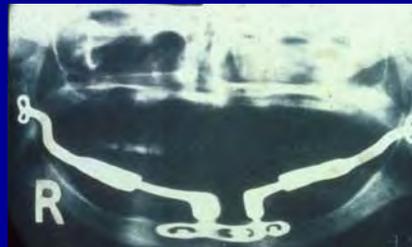


"A science of uncertainty and an art of probability"

Therapy / Prevention / Education

- Which implant design / surgical technique / maintenance regime / education strategy provides the *best result**?

* *Clinical, patient-centred, surrogate or economic outcomes*





"A science of uncertainty and an art of probability"

Therapy / Prevention / Education

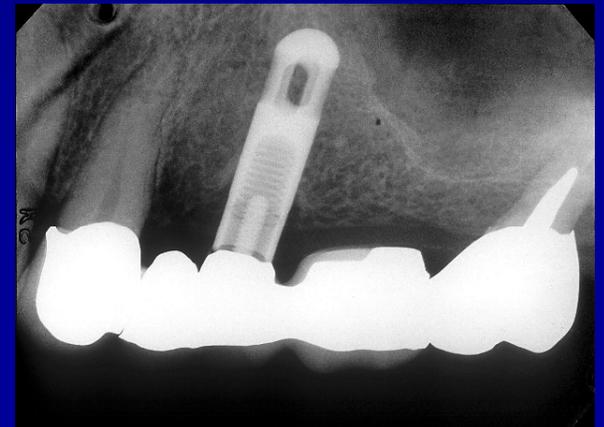
1. Random allocation of the participants to the different interventions
2. Outcome measures of importance for at least 80 per cent of participants who entered the investigation
3. A statistical analysis consistent with the study design



“A science of uncertainty and an art of probability”

Prognosis

- How predictable is the performance of the implant “Speedy Fantastico” in the upper posterior jaw?
- What is the risk that patients will experience a fractured screw / abutment or implant?





"A science of uncertainty and an art of probability"

Prognosis

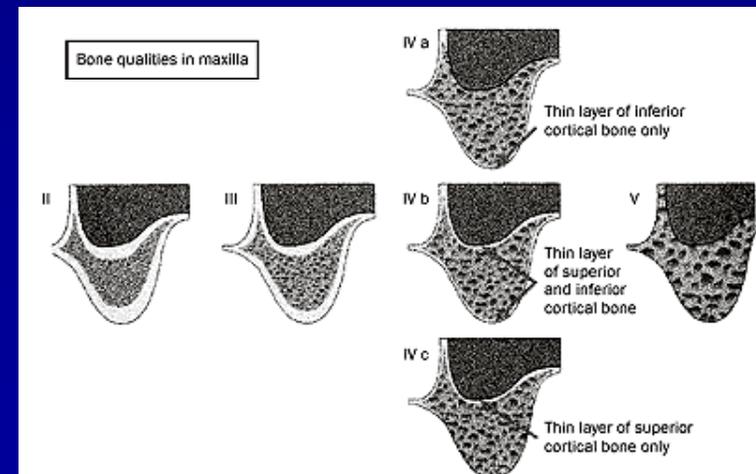
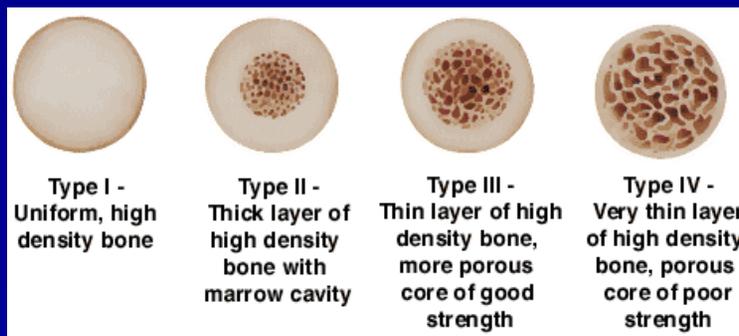
1. A cohort of persons, all initially free of the outcome of interest
2. Follow-up of at least 80 per cent of patients until the occurrence of either a major study criteria or the end of the study
3. A statistical analysis consistent with the study design.



“A science of uncertainty and an art of probability”

Diagnostic tests

- Does the use of RFA or the Periotest to predict loading strategy have any merits?
- What is the validity of the Zarb and Lekholm bone quality classification?





“A science of uncertainty and an art of probability”

Diagnostic tests

1. Clearly identified comparison groups, at least one of which is free of the target disorder
2. Either an objective diagnostic standard or a contemporary clinical diagnostic standard with reproducible criteria
3. Interpretation of the test without knowledge of the diagnostic standard result
4. Interpretation of the diagnostic standard without knowledge of the test result
5. A statistical analysis consistent with study design



"A science of uncertainty and an art of probability"

Etiology – Harm

- Does trace elements from implants cause adverse general effects?
- Has a certain batch of implants been contaminated during the production process?



“A science of uncertainty and an art of probability”

Etiology – Harm - Causality

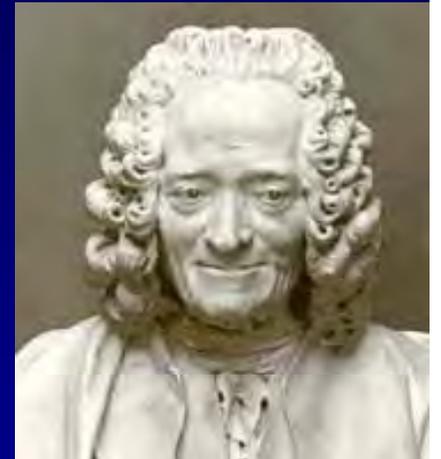
- Randomised controlled trial > clinical controlled trial > cohort > case -control > cross-sectional > single case
- A statistical analysis consistent with the study design.

Thus: Purely probabilistic considerations



“A science of uncertainty and an art of probability”

*“ Doctors prescribe
medicine of which they
know little, to cure diseases
of which they know less, in
human beings of which they
know nothing”*



Voltaire

French Philosopher (1694-1778)



"A science of uncertainty and an art of probability"

Views /beliefs /perceptions

- How does implant prostheses impact on the patient's daily life?
- Why are colleagues hesitant to implement implant prosthetics in their practices?



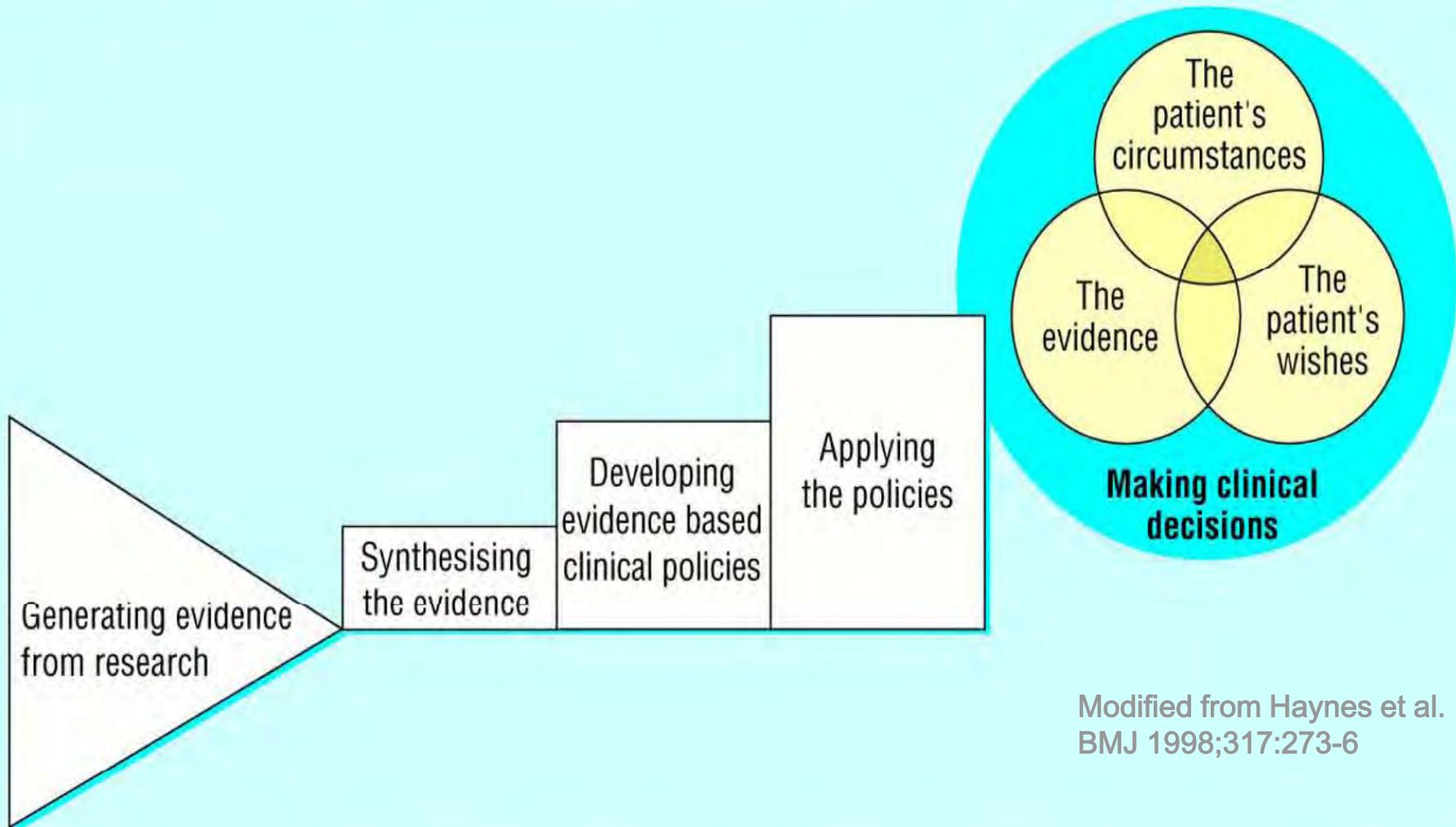
“A science of uncertainty and an art of probability”

Study Designs and strengths

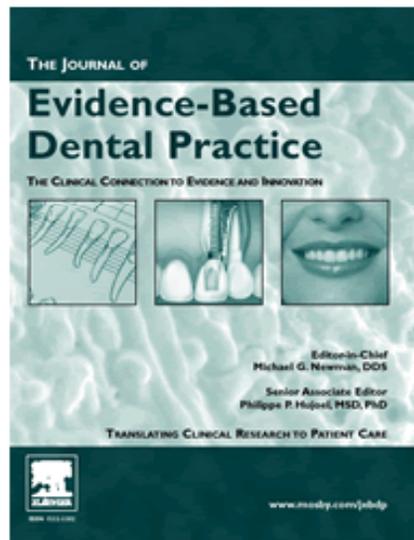
	Qualitative research	Cross-sectional Survey	Case Control	Cohort	CCT	RCT	Systematic review
Effectiveness: Does it work?				☆	☆	☆☆	☆☆☆
Process of intervention/delivery: How does it work?	☆☆	☆			☆	☆	☆☆☆
Salience: Does it matter?	☆☆	☆☆					☆☆☆
Safety: Will it do more good than harm?	☆		☆	☆	☆	☆☆	☆☆☆
Acceptability: Will the patient accept the intervention?	☆☆	☆			☆	☆	☆☆☆
Cost effectiveness: Is it worth paying for the intervention?						☆☆	☆☆☆
Appropriateness: Is this the right intervention for this patient?	☆☆	☆☆					☆☆
Satisfaction with the intervention: Are users, providers and other stakeholders satisfied?	☆☆	☆☆	☆	☆			☆



**EBM can be
implemented in daily
practice in various
ways**



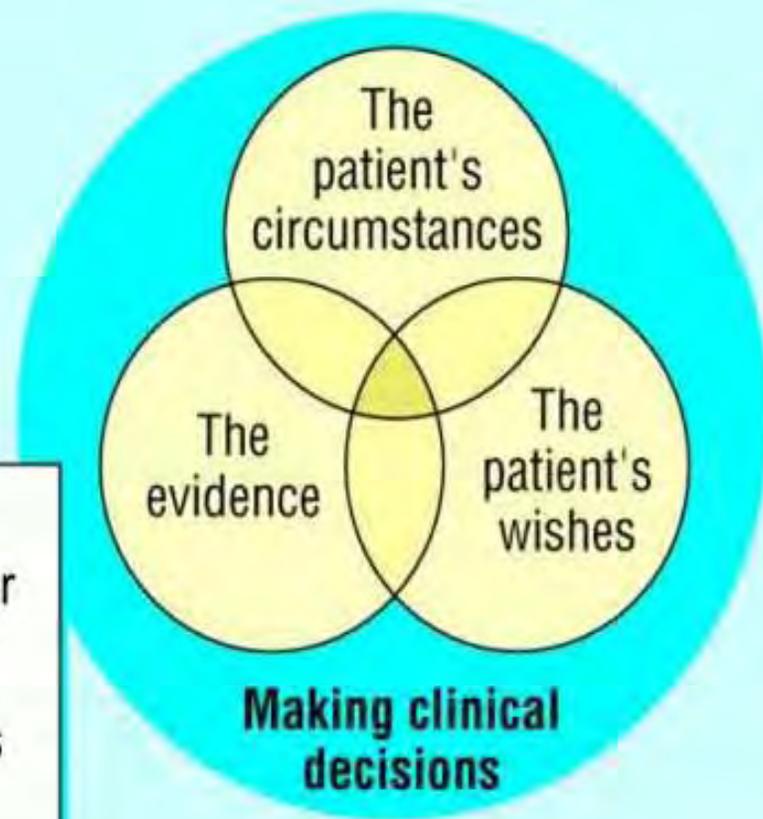
Modified from Haynes et al.
BMJ 1998;317:273-6



Generating evidence
from research

Synthesising
the evidence

Appraise for
reliability
validity
and results



Modified from Haynes et al.
BMJ 1998;317:273-6

PubMed A service of the National Library of Medicine and the National Institutes of Health
www.pubmed.gov

PubMed Nucleotide Protein Genome

for bone loss AND (dental implants[MESH] OR endosseous)

Limits

Display Settings

All: 685

EviDents Search Engine

for

ess <http://sumsearch.uthscsa.edu/>

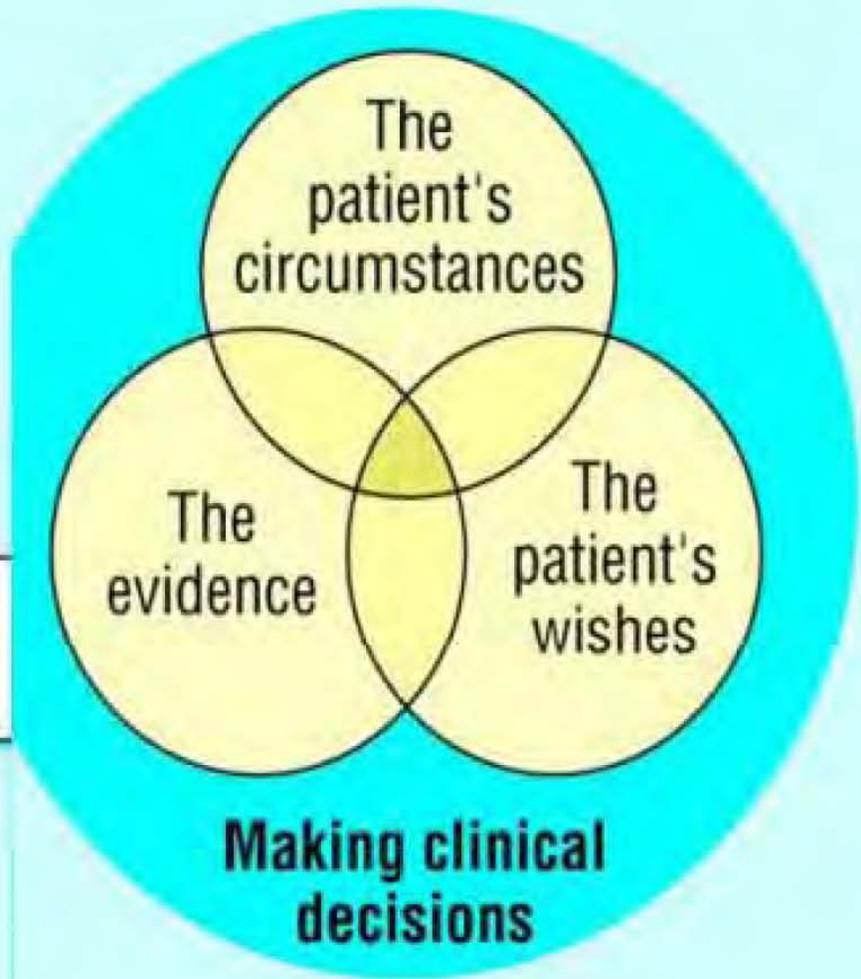
Optional) [About](#) [Español](#) [Français \(under revision\)](#) [Italiano](#) [Ita](#)

SUMSearch

SUMSearch selects the best resources for your question, formats your question for each resource, and makes additional searches based on results.

Generating evidence from research

Synthesising the evidence



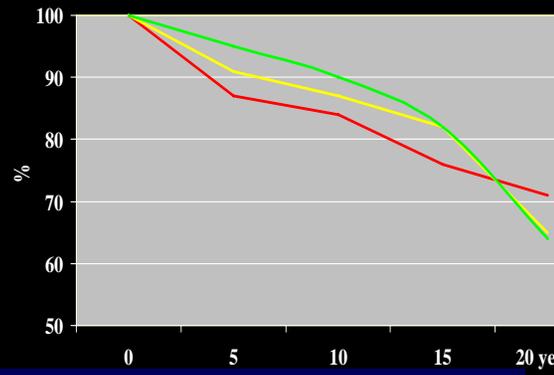
Modified from Haynes et al.
BMJ 1998;317:273-6



Correct treatment decision



Patient values & preferences



Survival estimates

Risk factors – odds ratios

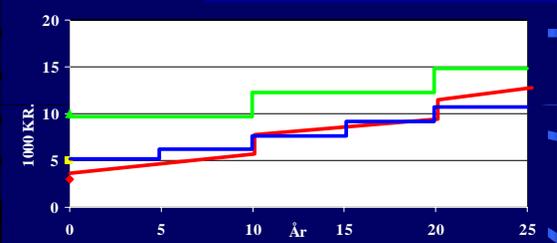
Independent variables	Bivariate odds ratios	significance	Confidence intervals bivariate odds ratios	odds ratios	significance	Confidence intervals for multivariate odds ratios
Age group						
20-30	-	-	-	-	-	-
30-40	2.32	**	1.15 - 3.13	2.52	**	1.35 - 3.33
≥40	2.63	****	1.43 - 3.08	2.63	****	1.83 - 3.8
Gender						
Male	-	-	-	-	-	-
Female	2.42	**				
Material						
Amalgam	-	-	-	-	-	-
Composites	1.12	NS				
Glass ionom.	3.12	****				
Dentists						
#1	-	-	-	-	-	-
#2	1.34	NS				
Location						
Mandible	-	-	-	-	-	-
Maxilla	1.55	*				



Outcome probabilities



% worst case scenarios



Dentist:patient relationship
Two-way communication





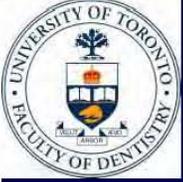
*“Guerir quelquefois,
soulager souvent,
consoler toujours”*

*“Cure occasionally,
relieve often,
console always”*



Ambroise Paré
French Physician
(1510 –1590)





Overall strength of current oral implant research



Review of existing literature

Eckert S et al. Validation of dental implant systems through a review of literature supplied by system manufacturers. J Prosthet Dent 1997;77: 271-9.

Conclusion:

On the basis of the literature supplied by the manufacturers, only one implant system demonstrated scientifically valid long-term success.



Situation, 1999

1. The number of implants and implant systems increase continuously worldwide
2. The FDI World Dental Federation is concerned about the quality of all the new implants being marketed
3. The FDI Science Committee is asked to investigate the issue
4. The work is commissioned to prof. A Jokstad





Implant brands/ systems available in N. America in 1999 (n=98)

REVIEW ARTICLE

Implants and Components: Entering the New Millennium

Paul P. Binon, DDS, MSD¹

The elusive dream of replacing missing teeth with artificial analogs has been part of dentistry for a thousand years. The coincidental discovery by Dr P-I Brånemark and his coworkers of the tenacious affinity between living bone and titanium oxides, termed *osseointegration*, propelled dentistry into a new age of reconstructive dentistry.

Initially, the essential tenets for obtaining osseointegration dictated the atraumatic placement of a titanium screw into viable bone and a prolonged undisturbed, submerged healing period. By definition, this required a 2-stage surgical procedure. To comply, a coupling mechanism for implant placement and the eventual attachment of a transmucosal extension for restoration was explored. The initial coronal design selected was a 0.7-mm-tall external hexagon. At its inception, the design made perfect sense, because it permitted engagement of a torque transfer coupling device (fixture mount) during the

replacement, maxillofacial and a myriad of other applications, limited only by the ingenuity and skill of the clinician.¹¹⁻¹³ The external hexagonal design, ad modum Brånemark, originally intended as a coupling and rotational torque transfer mechanism, consequently evolved by necessity into a prosthetic indexing and antirotational mechanism.^{14,15} The expanded utilization of the hexagonal resulted in a number of significant clinical complications.^{8-11,16-22} To mitigate these problems, the external hexagonal, its transmucosal connections, and their retaining screws have undergone a number of modifications.²³ In 1992, English published an overview of the then-available external hexagonal implants, numbering 25 different implants, all having the standard Brånemark hex configuration.¹⁴ The external hex has since been modified and is now available in heights of 0.7, 0.9, 1.0, and 1.2 mm and with flat-to-flat widths of 2.0, 2.4, 2.7, 3.0, 3.3, and 3.4 mm,

***Jokstad, Brägger, Brunski, Carr,
Naert, Wennerberg. Int Dent J
2003; 53 Sup 2: 409-33***

Asbjørn Jokstad, Oslo, Norway
Urs Braegger, Bern, Switzerland
John B. Brunski, Troy, USA
Alan B. Carr, Rochester, USA
Ignace Naert, Leuven, Belgium
Ann Wennerberg, Gothenburg, Sweden





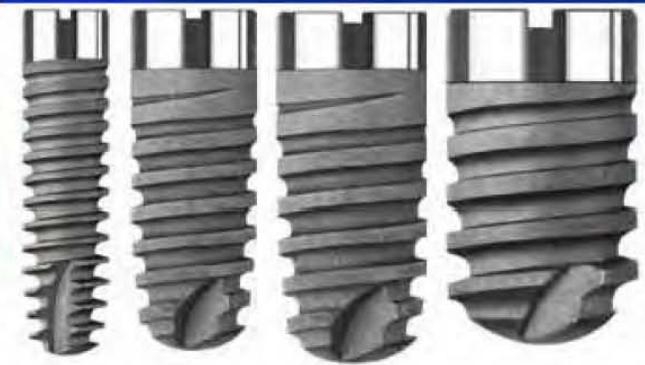
Commercially available implant and implant systems in October 2003:

225 implant brands

78 manufacturers – from all continents

~70 implant brands no longer marketed



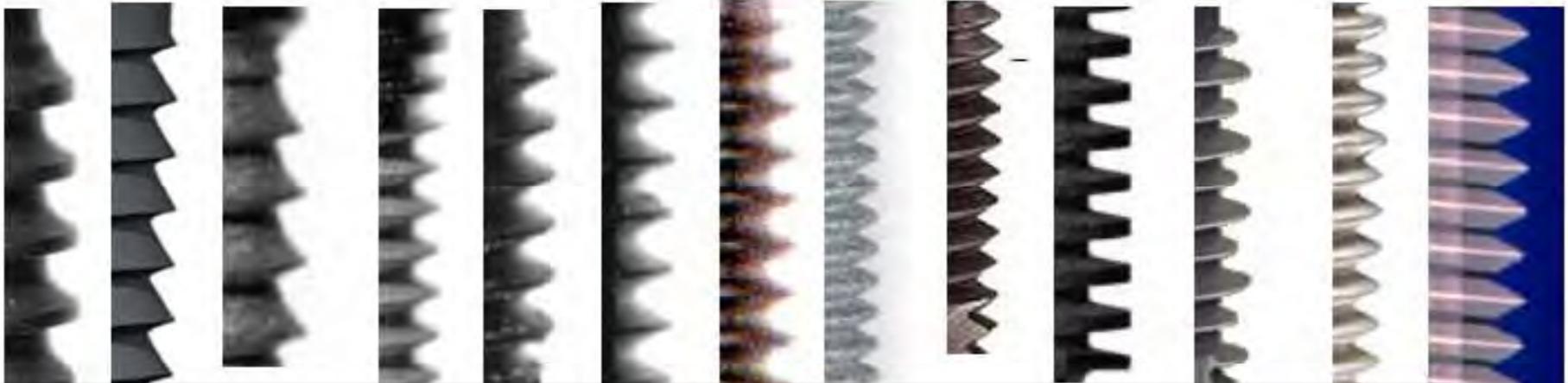
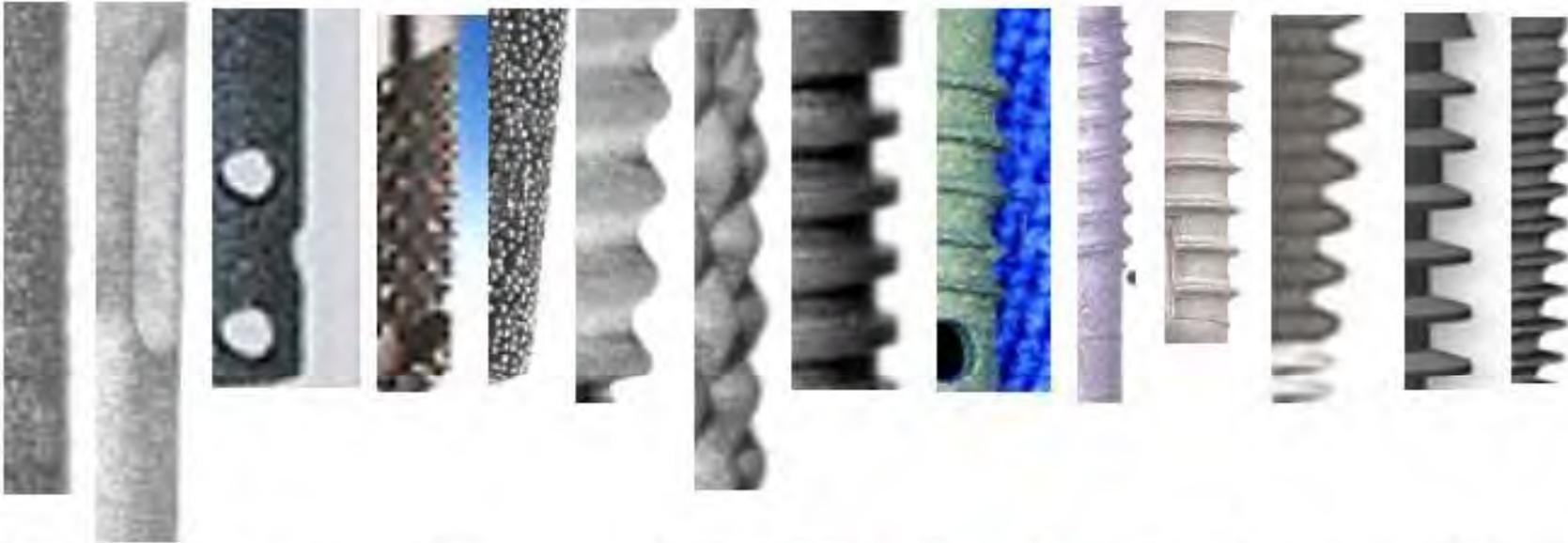


Straight, Tapered, Conical, Ovoid, Trapezoidal, Stepped & combinations ...



Flange design

- Flange vs. no flange
- Straight vs. flared vs. widening
- Height
- Polished vs. threads
- Added features
- Surface topography



- Threads vs. non-threads
- Shape: V- vs. square- vs. reverse buttress- vs. combinations
- Number and size of “lead threads”
- Number and location of grooves, groove forms and groove sizes
- Surface micro-topography
- Thread angle



Apex

- Threaded vs non-threaded
- V-shape vs flat vs curved apex
- Holes, round, oblong
- Apical chamber
- Grooves and groove size
- Flared apex
- Surface topography

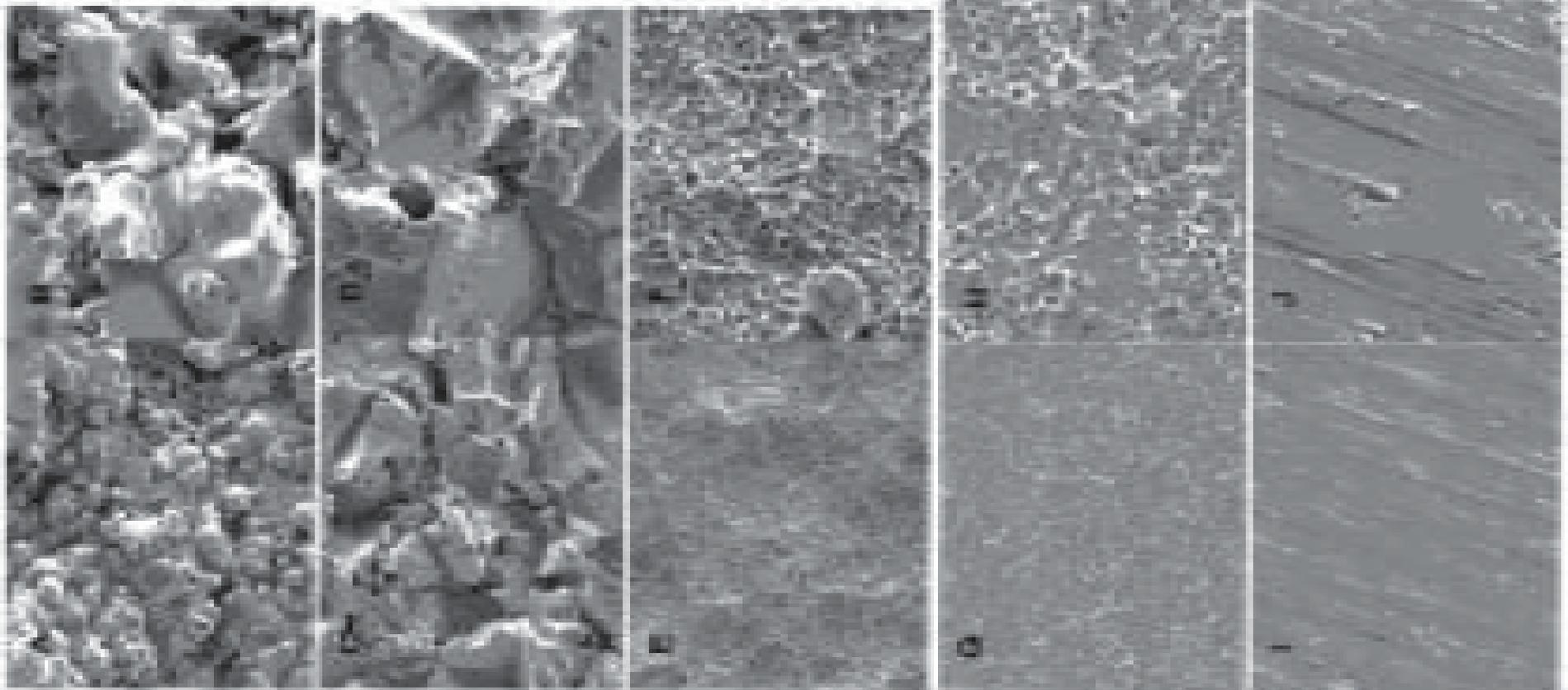


Interface geometry

- External vs Internal
- Hexagonal vs. Octagonal vs cone
- Morse taper
- Rotational vs non-rotational
- Added non-rotational features
- Heights & widths
- Butt vs bevel joints
- Slip-fit vs friction-fit joints
- Resilience vs nonresilience



High (top) and low (bottom) magnification of cpTi surfaces as used for surface characterization.



Plasma-sprayed (TPS);

Grit-blasted

Grit-blasted and dual acid-etched

Dual acid-etched

Machined (turned)

Davies, 2003

<u>Surface topography</u>	<u>Machining process</u>	<u>Example</u>
Anisotropic with oriented cutting marks	Turned	Brånemark System® MKIII (Nobel Biocare)
Isotropic	Blasted	TiO ₂ particles (Tioblast®, AstraTech)
Isotropic	Blasted + acid etched	1. Large size Al ₂ O ₃ particles & HCl & H ₂ SO ₄ (SLA®, Straumann) - 2. Tricalcium phosphate & HF & NO ₃ (MTX®, Centerpulse)
Isotropic with high frequency irregularities	Acid etched	HCl / H ₂ SO ₄ (Osseotite®, 3i)
Isotropic and rough	Hydroxyapatite coated	Sustain® (Lifecore)
Isotropic and rough	Titanium Plasma Sprayed	ITI® TPS (Straumann)
Isotropic with craterous structure	Oxidized	TiUnite® (Nobel Biocare)



Clinical documentation



- | | |
|--------------------------------------------------------------------------------------------------------------------------------|----|
| <u>A. Implant or implant system with extensive clinical documentation: >4 clinical trials</u> | 10 |
| <u>B. Implant or implant system with limited clinical documentation, i.e. <4 trials, but of good methodological quality</u> | 11 |
| <u>C. Implant or implant system with limited published clinical documentation</u> | 29 |
| <u>D. Implant or implant system with no published clinical documentation.</u> | 28 |

Quality Assessment of Randomized Controlled Trials of Oral Implants

Marco Esposito, DDS, PhD¹/Paul Coulthard, BDS, MFGDP, MDS, FDSRCS, PhD²/
Helen V. Worthington, BSc, MSc, PhD, FIS³/Asbjørn Jokstad, DDS, PhD⁴

The aim of this study was to assess the quality of randomized controlled trials (RCTs) concerned with the effectiveness of oral implants and to create a trial register. A multilayered search strategy was used to identify all RCTs published by the end of 1999 in any language. The Cochrane Oral Health Group specialist register, PubMed, and personal libraries were searched. Seventy-four RCTs were identified. Forty-three articles, not presenting the same patient material, were independently assessed by 3 researchers using a specially designed form. A statistician assessed all trials for the appropriateness of statistics. The quality of each study was assessed on 7 items, including 3 key domains. Randomization and concealment allocation procedures were not described in 30 articles (70%). Reasons for withdrawals were not given in 10 reports (23%). No attempt at blinding was reported in 31 studies (72%).

The quality of RCTs of oral implants is generally poor and needs to be improved. (INT J ORAL MAXILLO-

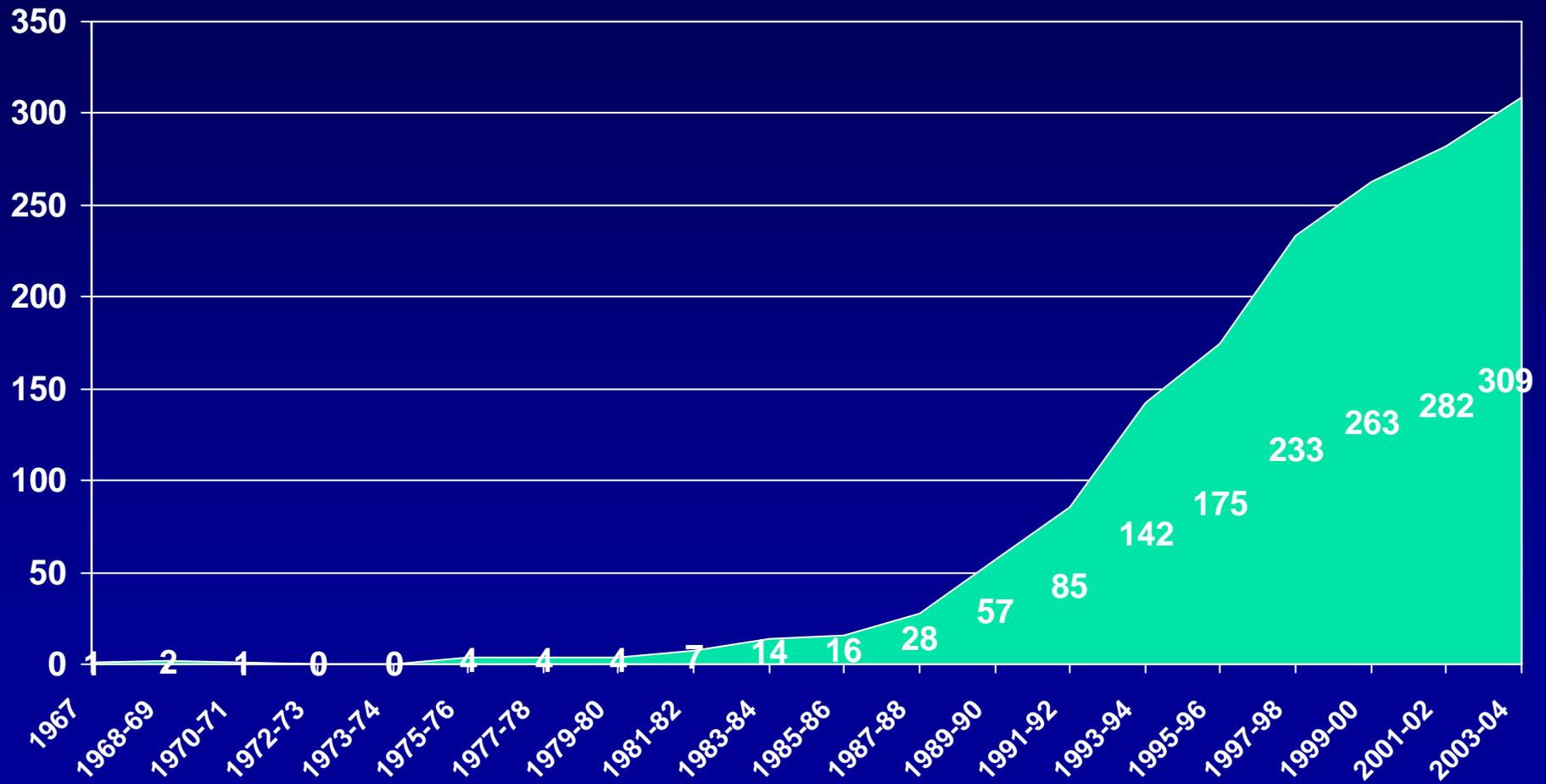
The quality of RCTs of oral implants is generally poor and needs to be improved



Clinical documentation of new implant systems

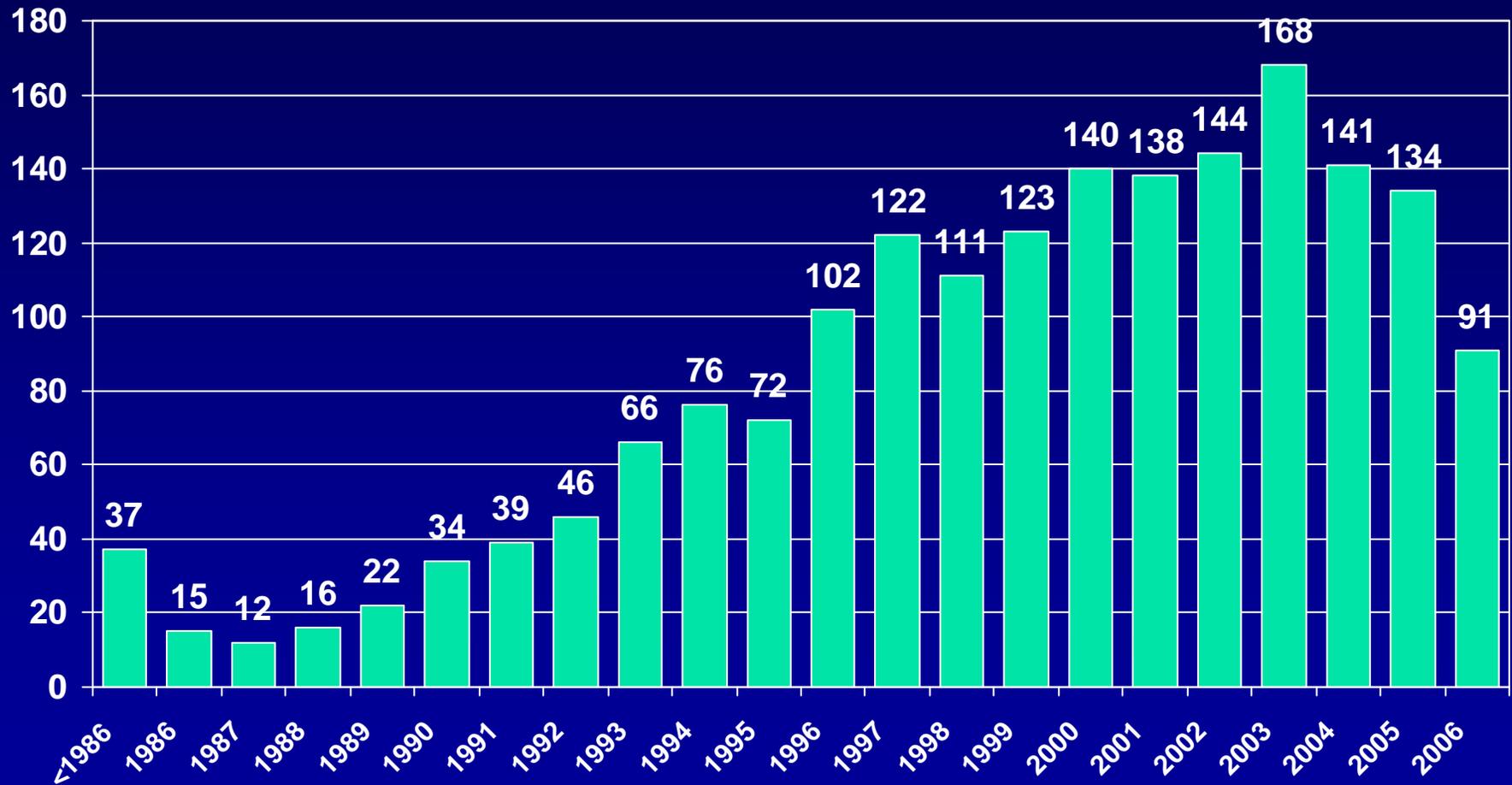


Clinical trials – Dental implants





Clinical trials – Dental implants





Implant Manufacturers

<i>USA:</i>	28
<i>Germany:</i>	25
<i>Italy:</i>	14
<i>Korea:</i>	8
<i>Spain:</i>	8
<i>Brazil:</i>	5
<i>Switzerland :</i>	5
<i>Canada:</i>	4
<i>France:</i>	4
<i>Sweden:</i>	4
<i>Israel:</i>	3
<i>United Kingdom:</i>	3
<i>Other countries:</i>	9



per 2.2007
(n=120!)



Implant systems introduced since October 2003 ?

The screenshot shows the PHI Primary Healing Implant website interface. At the top, there are flags for Italy and the UK, followed by the PHI logo and the text "Primary Healing Implant™". A "Back" button is visible. Below the logo, there are navigation buttons for "Introduction" and "Instructions". A "Products" menu is on the left, with "IMPLANTS" selected. The main content area displays a table of implant products with columns for "picture", "description", and "code".

picture	description	code
	RMS implants	VVR
	Smooth titanium implant	VVI
	Plasma-sprayed implants	VVI
	Gold sanded titanium implant	VVO
	Sanded implants	VVH

Jokstad A, et al. Quality of dental implants. Int Dent J. 2003;53(6 Suppl 2):409-43



Binon PP. Implants and components: entering the new millennium. Int J Oral Maxillofac Implants. 2000;15:76-94.

English CE. Implants. Part three. An overview. CDA J. 1988;16: 34-8.

TODAY





Clinical trials – Dental implants

Clinical trials since 2003 = 362

➤ Brånemark / Replace	122
➤ ITI /Straumann	79
➤ 3i/Osseotite	34
➤ Frialit2/Frialit+/Frialoc/Frios	23
➤ Astra	<u>18</u>

267 (73%)





New Implant materials

Willkommen bei Z-Systems

- :: Deutsch
- :: Englisch
- :: Français
- :: Español
- :: Italiano



World's first certified
Dental Zirconiumoxide Implants

Home - Microsoft Internet Explorer provided by Faculty of Dentistry

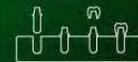
help



Address: <http://www.z-systems.co.nz/>



World's first certified
Dental Zirconiumoxide Implants



- :: Home
- :: Research
- :: Products
- :: Users
- :: Patient cases
- :: Facts
- :: Publications
- :: Disclaimer
- :: Contact
- :: Links

Service Hotline
Phone: +64(0)9 424 5917
Fax: +64(0)9 428 3641
Mobile: +64(0)21 071 5140
Email: contact@z-systems.co.nz

Username
Password
 Remember me

Login

[Forgot your password?](#)



**Time for a change?
Metal free dental aesthetics
with Z-Systems**

Z-Lock ceramic dental implants are revolutionising Europe, and are the only certified ceramic implants available in New Zealand.

[more...](#)



**Use existing tools –
or go 100% metal-free**

You can place Z-Lock ceramic dental implants using most standard implant surgical instruments so set up costs are minimal. Alternatively you can choose to provide a 100% metal free service using Z-Systems latest technology in ceramic tools.



Certified bio-inert

Z-Lock ceramic dental implants have passed all required biocompatibility tests and are certified and approved.

In contrast to titanium, fully ceramic materials have a reduced tendency towards



Cosmetically superior

Can you see white through white?

Z-lock ceramic dental implants have a distinct colour advantage over titanium dental implants which tend to show through the thin buccal gingiva, giving a discoloured

Z-Systems Australasia Limited

:: Courses

Are you ready for the next generation in implant technology ?

[Register](#) today for upcoming courses.

:: News and Events

New Product - Diamond Bur Kit Now Available

Live OP Coming Soon

Advanced Available for

search... **Search**



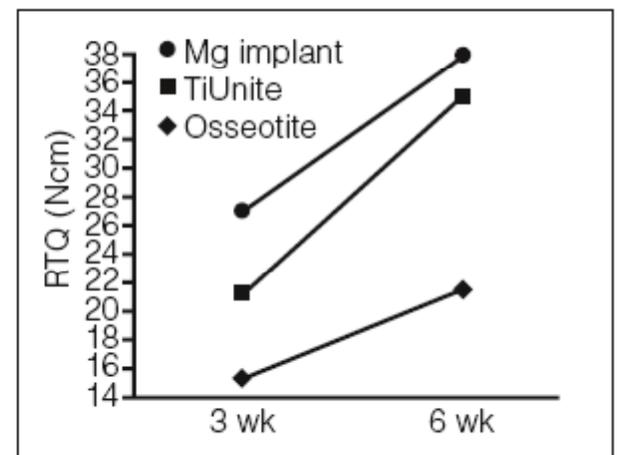
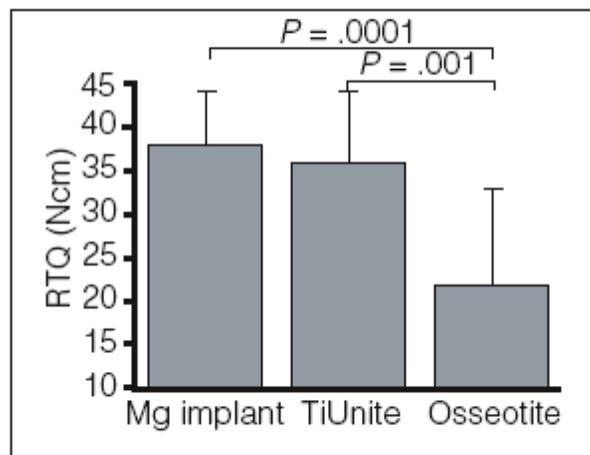
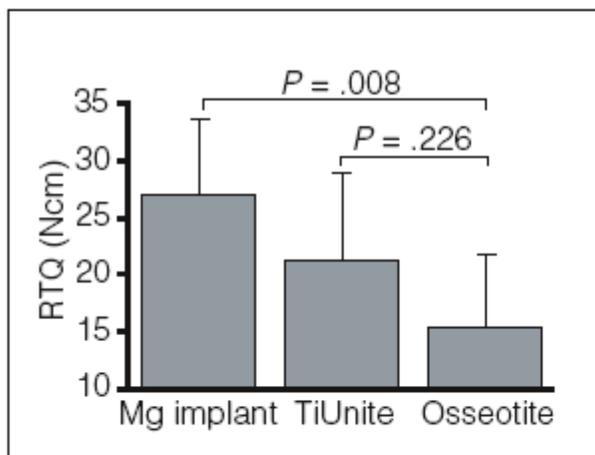
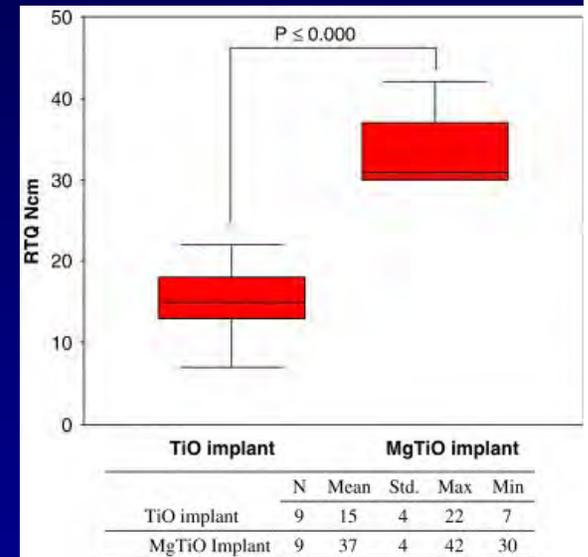
New Implant surface treatment

➤ Magnesium ion incorporated, oxidized implants ? Dr Young-Taeg Sul - Korea



Sul YT, et al.
Biomaterials. 2005
Nov;26(33):6720-30

Sul YT, et al. Int J Prosthodont. 2006;19:319-28



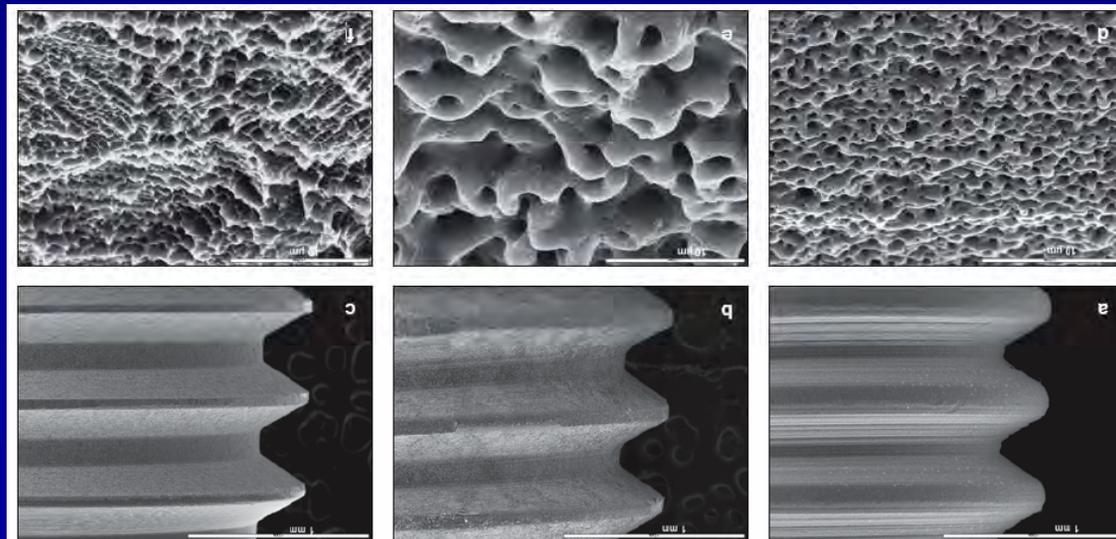
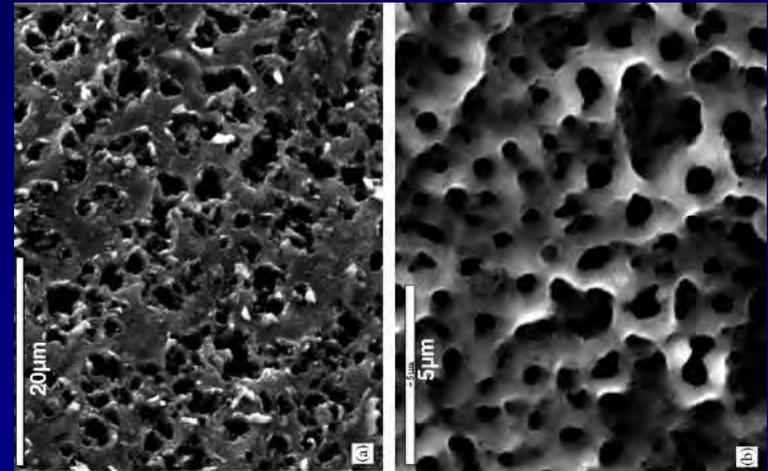


Implant surface treatment

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www.torontoimplantconference.ca

The Toronto Osseointegration Conference Revisited

25 years since the 1982 Toronto Conference on Osseointegration in Clinical Dentistry

What about the future?

May 8 - 10, 2008

Metro Toronto Convention Centre



*Clinical relevance of
animal models for
predicting implant
therapy outcomes?*



The relevance of data from animal models to predict longitudinal trial results?

➤ is high?

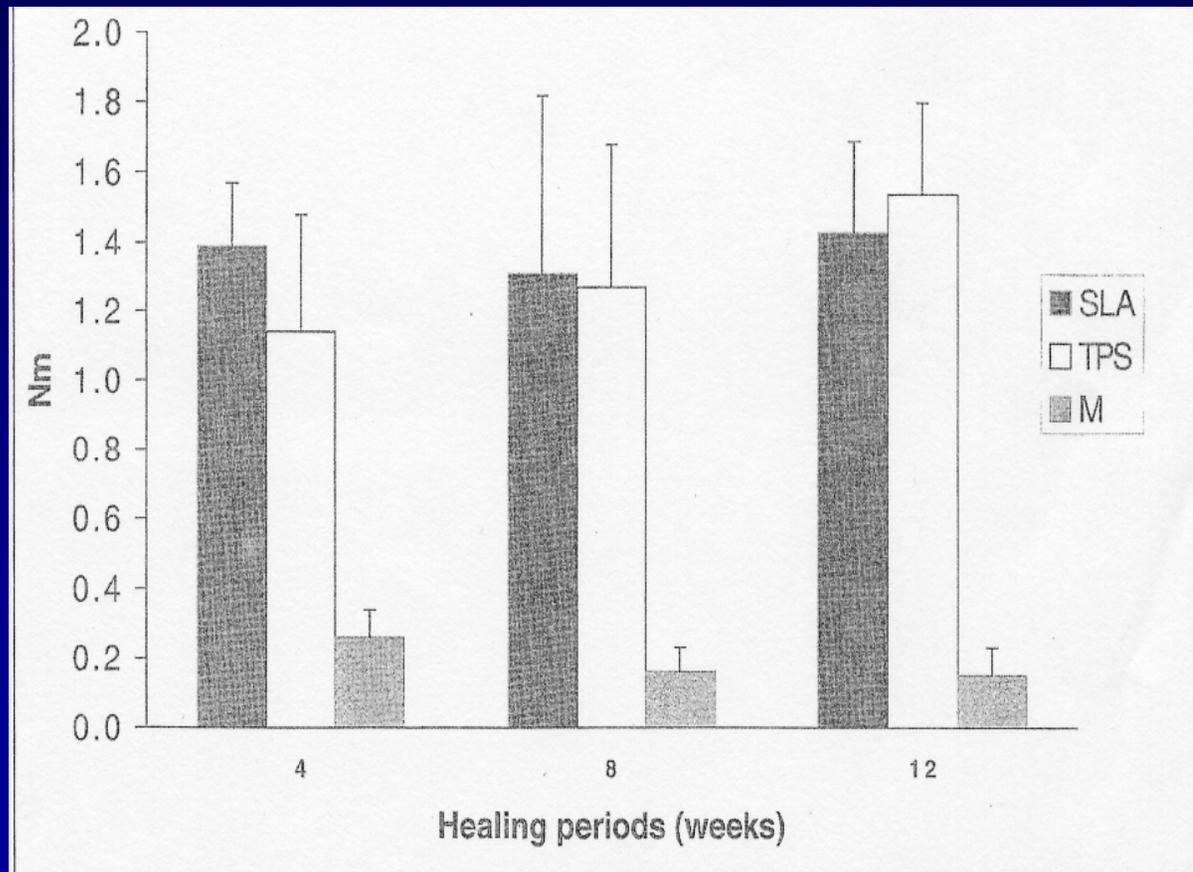


Figure 1. Removal torque values (RTV) in Newtonmeters (Nm) of three implant types machined (M), titanium-plasma-sprayed (TPS), and sandblasted with large-grit and acid-attacked (SLA) surfaces after 4, 8, and 12 wks of healing in the maxillae of miniature pigs (from Buser *et al.*, 1999b; reprinted with permission).





Relevance animal models *vz.* longitudinal trial results?

- Surface topography description?
- Model used?
- Roughness characterization?
- Measuring device?
- Consistency of results?
- Surgical technique for placement?





Variables affecting histologic/biomechanical data

Implant
length

Implant
diameter

Implant
design

Implant
material

Surface
topography

Animal
model

Implantation
time

Implantation
site

Biomechanical
loading speed

Functional
loading
conditions

Analyzed
length

Orientation of
histologic
section

Sykaras et al., 2000





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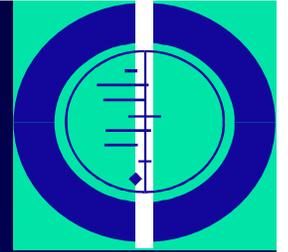
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THE EFFICACY OF DENTAL IMPLANTS: EVIDENCE-BASED OVERVIEWS

From 11 Cochrane reviews on
osseointegrated dental implants

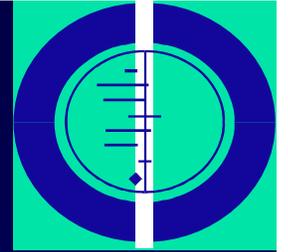
Last update, Jan 2007

Esposito, Coulthard, Worthington;

Thomson, (Wennerberg, Jokstad et al.)

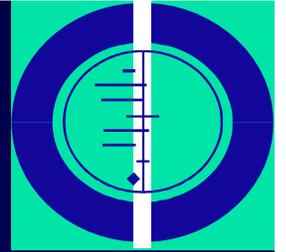


Cochrane systematic reviews



1. Fresh extraction sockets 2006
2. Perimplantitis 2006 ver.2
3. Bone augmentation techniques 2006 ver.2
4. Zygomatic implants 2005 ver.2
5. Various implant systems 2003 ver.3
6. Immediate/early or delayed loading 2004 ver.2
7. Maintenance 2004 ver.2
8. Hyperbaric oxygen therapy 2003
9. Use of prophylactic antibiotics 2003
10. Surgical techniques 2003
11. Preprosthetic surgery vs implants 2002

1. *Fresh extraction sockets*



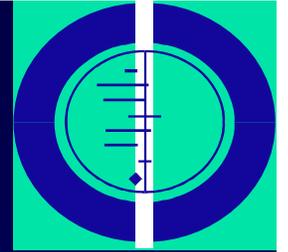
Last literature search: Aug 2006

2 RCTs – 96 patients

Conclusion:

May offer some advantages in terms of patient satisfaction and aesthetics possibly by preserving alveolar bone.

Properly designed RCTs are still needed to fully evaluate the potential advantages and risks of this treatment modality since more complications and failures may occur



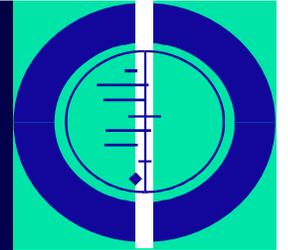
2. Perimplantitis - ver 2. 2006

Last literature search: March 2006
5 RCTs – 134 patients

Conclusion:

There is no reliable evidence suggesting which could be the most effective interventions for treating perimplantitis.

3. Bone augmentation techniques – ver. 2 2006



Last literature search: October 2005

13 RCTs – 330 patients

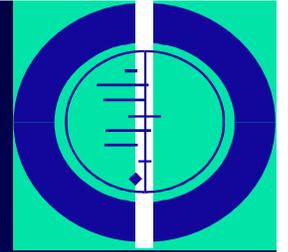
Conclusion:

Major bone grafting procedures of extremely resorbed mandibles may not be justified.

Bone substitutes may replace autogenous bone for sinus lift procedures of extremely atrophic sinuses.

Both guided bone regeneration (GBR) procedures and distraction osteogenesis can augment bone vertically, but it is unclear which is the most efficient technique.

4. Zygomatic implants – ver 2. 2005



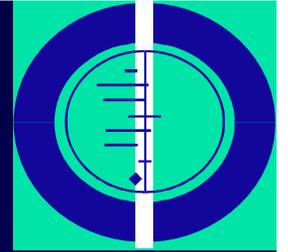
Last literature search: May 2005
0 RCTs

Conclusion:

Cannot answer whether Zygomatic implants without bone grafting versus conventional implants in grafted or regenerated bone is superior

5. Various implant characteristics & systems

ver.3 -2005



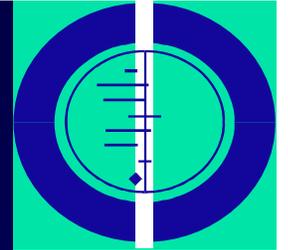
Last literature search: June 2004

12 RCTs with 512 participants and 12 different implant systems (19 RCTs were excluded). 4 RCTs with a 5-year follow-up

Conclusion:

Minor differences in marginal bone loss and in the occurrence of periimplantitis. No statistically significant difference in failure rates. We do not know whether any implant system is superior to the others.

6. Immediate, early or conventional loading - ver.2-2004



Last literature search: February 2004

5 RCTs with 124 participants (2 RCTs excluded)

Conclusion:

While it is possible to successfully load oral implants immediately after their placement in mandibles of adequate bone density and height of carefully selected patients, it is yet unknown how predictable this approach is.



*Thank you for your
kind attention*