

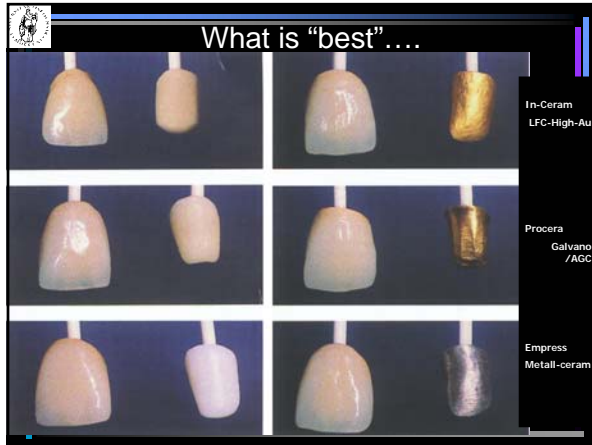
# Key issues in prosthodontic treatment planning for long-term outcomes

WHAT IS THE EVIDENCE FOR:  
Ceramo-metal and/or all ceramic crowns

Asbjørn Jokstad  
University of Oslo, Norway



Authors	Title	Source
Adair PJ, Grossman DG	The castable ceramic crown	Int J Periodontics Restorative Dent
Alberi JV, Bustone CJ, Goldberg A	Longitudinal clinical evaluation of fiber-reinforced composite fixed part	J Prosthet Dent 1994; 71(1): 16-22
Anderson RJ, Janes GR, Sabella L	Comparison of the performance on prosthodontic criteria of several all-ceramic crowns	J Prosthet Dent 1993; 69(1): 1-8
Andersson M, Bergman B, Bessing	Clinical results with titanium crowns fabricated with machine duplication	Acta Odontol Scand 1989; 47(5): 2
Augstun M	Klinische Nachuntersuchungen zu palladium- und hochgoldhaltigem Ze Dtsch Zahnärztl Z 1996; 51: 402	
Babbush CA, Greene AH	Implant dentistry: a long-term survey and comparative study with fixed J Oral Implantol 1977; 7: 89-105	
Blader J, Rieber R, McFall W, Ramo	Effect of crown margins on periodontal conditions in regularly attending J Prosthet Dent 1991; 65: 75-9	
Blader J, Rieber R, McFall WT Jr	The effect of crown receipt on measures of gingival status J Dent Res 1991; 70(10): 1386-9	
Barlett MT	Failures in ceramometal fixed restorations J Prosthet Dent 1984; 51: 186	
Battened DA	Failure of maxillary canine retainers for fixed prostheses Int J Prosthodont 1999; 2(5): 429-4	
Berley CD, Drake CW	Longevity of restorations in a dental school clinic J Dent Educ 1986; 50(10): 594-600	
Bergenholtz G, Nyman S	Endodontic complications following periodontal and prosthetic treatment J Periodontol 1984; 55: 63-68	
Bergman B, Bessing C, Ericson G	A 2-year follow-up study of titanium crowns Acta Odontol Scand 1990; 48(2): 5	
Bergman B, Lundquist P, Sjogren L	Restorative and endodontic results after treatment with cast posts and J Prosthet Dent 1986; 62: 10-15	
Bergman B, Marklund S, Nilson H	An intradividual clinical comparison of 2 metal-ceramic systems Int J Prosthodont 1999; 12(5): 444	
Bergman B, Nilson H, Andersson M	A longitudinal clinical study of Procera ceramic-veneered titanium copings Int J Prosthodont 1999; 12(2): 135	
Bergman B, Nilson H, Andersson M	Dentacolor as veneering materials for titanium Swed Dent J 1994; 18: 25-8	
Bierek KW	All-ceramic Hi-Ceram crown restorations: a clinical 5-year-study Dtsch Zahnärztl Z 1992; 47: 614-6	
Blitar R	Klinische Nachuntersuchungen von pulvermetallurgisch hergestellten Ze Dtsch Zahnärztl Z 1991; 46: 238	
Blitar R, Kinkle T, Matzinger A	Longitudinale Studie zum Frakturrisiko von hydrothermaler Verblendze Dtsch Zahnärztl Z 1997; 52: 291	
Bond A, Morrison WH	Clinical evaluation of adhesively placed Cerac endo-crowns after 2 years J Adhes Dent 1999; 1(3): 255-65	
Bond A, Morrison WH	Survival rate of mono-ceramic and ceramic-core CAD/CAM-generated Eur J Oral Sci 2004 Apr; 112(3): 1	
Bond A, Morrison WH	An up to 5-year clinical evaluation of posterior in-ceram CAD/CAM copings Int J Prosthodont 2002; 15(5): 451	
Black SM, Charlton G	Survival of crowns and bridges related to luting cements Restorative Dent 1990; 6(3): 26-30	



What is "best" ....

e.g. what is the best intervention?...  
i.e a question of therapy.  
Study requirements:

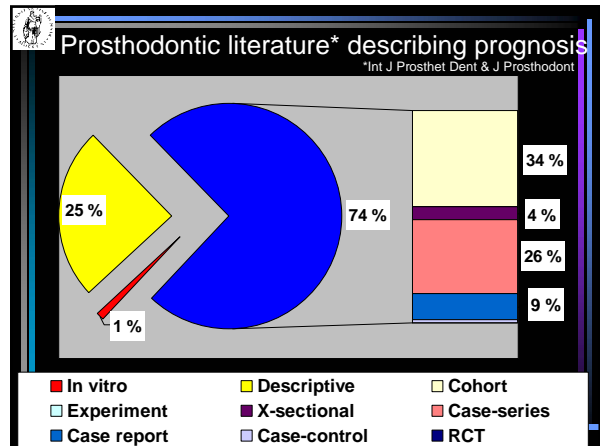
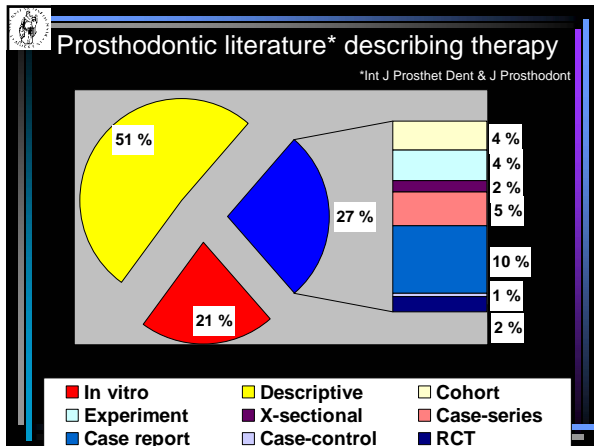
- Random allocation of the participants to the different interventions
- Outcome measures of known or probably clinical importance for at least 80 per cent of participants who entered the investigation
- A statistical analysis consistent with the study design.

e.g. what will ensue the intervention?...  
i.e a question of prognosis  
Study requirements:

- An inception cohort of persons, all initially free of the outcome of interest
- 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
- A statistical analysis consistent with the study design.

...or any other questions regarding implementing (new) therapeutic interventions:

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



### Prosthodontic literature on fixed partial dentures & strength of evidence (n ≈ 6700)

1: Systematic reviews	~20
2: RCTs	~20
3: Clinical trials	321*
4: Experimental studies	~2000
5: Opinions, descriptive studies, reports, etc.	>3000

\* <5yrs: 65%,  
5-10yrs: 25%,  
>10yrs: 10%

### RCTs – e.g. cement (6)

Study	Methods	Participants	Interventions	Outcomes	Results
White et al. 1994& 1995	Parallel RCT, function 6 mths, extraction, laboratory	Periodontally compromised teeth	2 cements, Zn-Ph, resin-modified glass-ionomer cement, b +dentin bonding agent	Extraction + embedded, sectioned microscopy	No differences
Kern et al. 1996	Split-mouth RCT. Dental school setting. Obs. Per. av 17 mths	60 enrolled & completed	Metal-ceramic partial & full single crowns. 2 cements, Zn-Ph, Ketac-Cem®	Sensitivity	No differences
Jokstad & Mjor (1996)	Parallel RCT. GP (3) setting. Observation period: 10 yrs	81 patient w/ 135 abutments enrolled. 88 abutm. remain at 10 yrs	Metal-ceramic FPDs & single crowns. 3 cements, Zn-Ph, Ketac-Cem®, Fuji Ionomer®	USPHS (Retention, Caries, margins)	No differences
Hilton et al. 2004	Parallel RCT. GP (10) setting. Observation period: 3 months	209 crowns	Metal/metal-ceramic single crowns. 2 cements: Fuji1®, Rely-X®	Sensitivity	No differences
Jokstad (2004)	Split-mouth RCT. GP (3) setting. Observation period: 6.5-8.5 yrs	22 patients w/ 39 pairs enrolled	Metal-ceramic Single crowns. 2 cements: Zn-Ph & Vitremer®	Sensitivity, GI, x-ray, CDA (Adaptation, Retention, Caries), pat. satisfaction	No differences (95% vs 97% surv.)

- ### Scientific evidence for FPDs
1. A large volume of the literature consists of narrative reviews
  2. Extrapolation from laboratory data is often used uncritically
  3. Many clinical studies are not appropriately designed to demonstrate clinical superiority and/or for survival estimations
  4. Most RCTs are small and underpowered
  5. Majority of clinical studies use surrogate outcomes and not patient/focused criteria
  6. Most clinical trials studies are done in secondary settings- not real life dentistry

