

## Role of the implant design on immediate loading

### Critical appraisal of the evidence from clinical trials

Asbjørn Jokstad, DDS, PhD  
UiT The Arctic University of Norway  
University of Toronto

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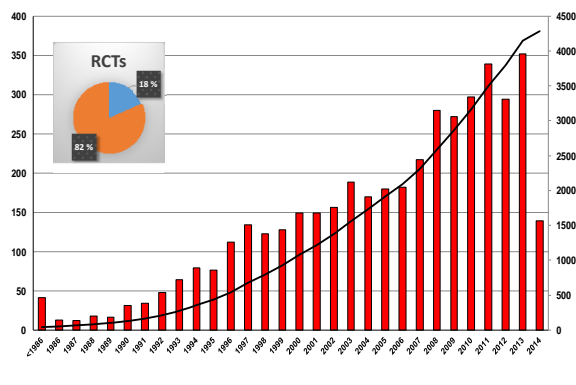
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# Publications reporting data from clinical studies on dental implants (n=4309)




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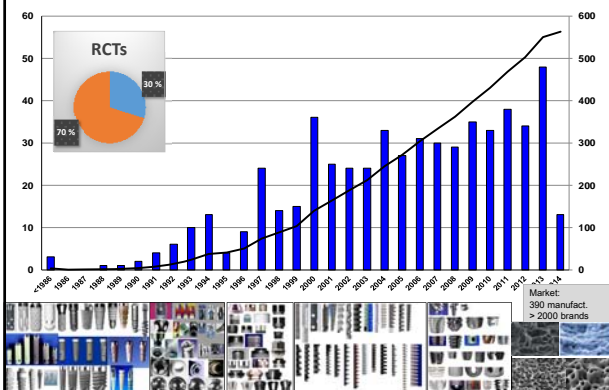
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# Publications on clinical studies on dental implants, with focus on effects of implant design factors (n=566)




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## General findings on immediate loading

693 reports

# Systematic reviews: 53 (11 in last 2 years)

First clinical research study: 1968 – 1975 (Brånemark et al. 1977: Experience over a 10-year period & 4 tps-implants anterior mandible (Ledermann 1978)

Longest clinical research study: 44p/176i over 12 years (range 8-18), retrospective study, ITI-tps anterior mandible (Lambrecht & Hodel 2007)

#RCT trials: 121 reports (18 in last 2 y.), 76 focus on loading comp., 51 unique RCTs

First: 10 p. with 40 Nobelbiocare Mk2 i. edent.mand. OD (Chiapasco et al. 2001)

Largest: 266 p. with 325 Straumann SLA i. for crown/3-4i-FDP(Zöllner et al. 2008)

Longest: 10 y. 106p/212i/2i-OD (Ma et al. 2010) & 9 y. 44p/121i (Rocci et al. 2013)

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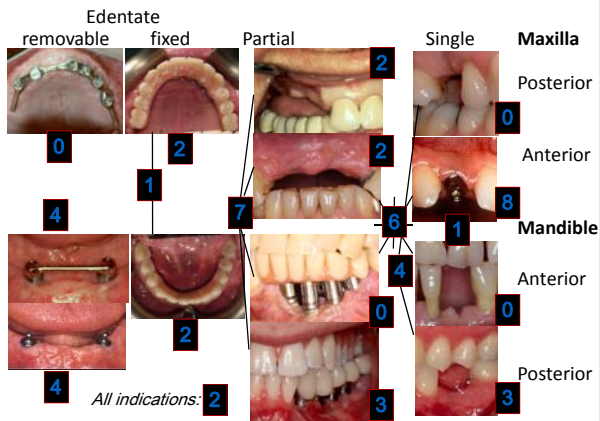
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121 RCT papers → 76 comparing healing protocols, 51 unique RCTs




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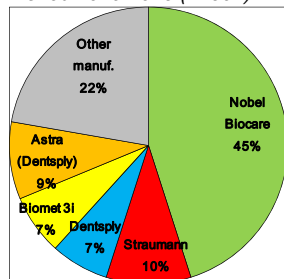
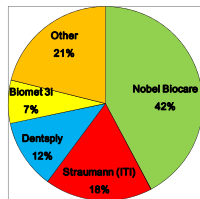
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Clinical trials with focus on shortened loading protocols according to implant brand

Prior to 2006 (n=186)

Period 2010-2015 (n=304)




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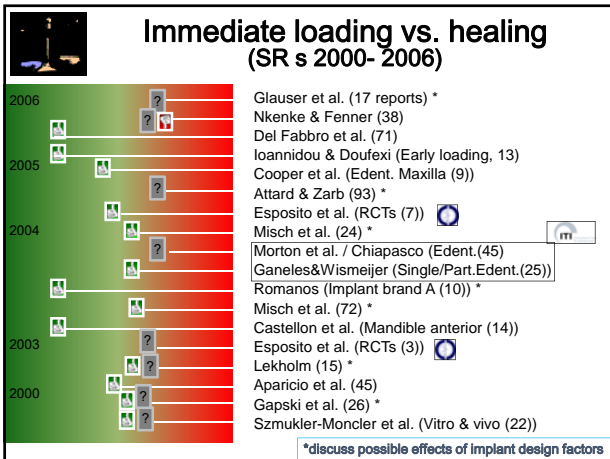
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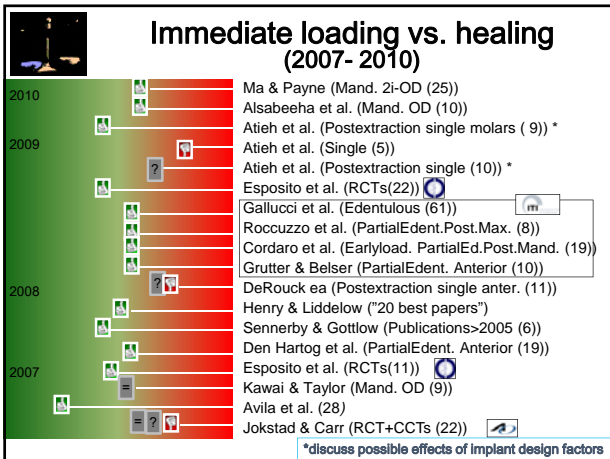
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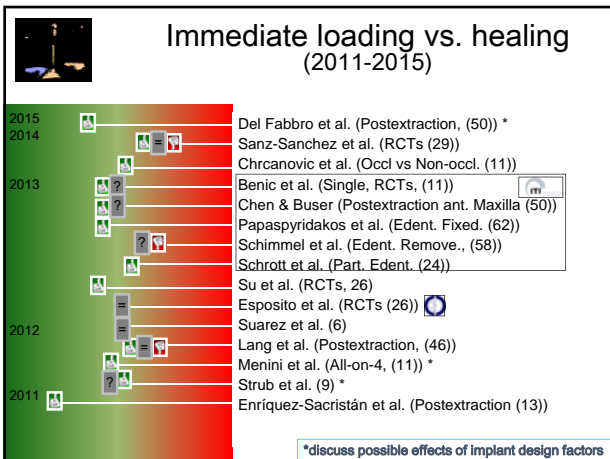
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### Pre-surgery modifiers

General & local risk factors  
Bone quantity and quality (jaw)  
Vertical dimension of occlusion  
Parafunctional habits

### Surgery modifiers?

Flap / Site preparation  
Primary stability

### Additional modifiers?

Single implant vs. Splinted implants  
Occluding vs. Non-occluding  
Implant design, including length

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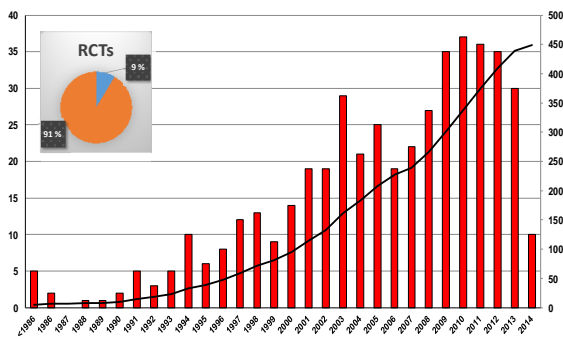
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## # Publications reporting data from clinical studies on dental implants, with focus on immediate implants (n= 462 / 4309 reports)



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## General findings on immediate implants

462 reports

# Systematic reviews: 22 (11 in last 2 years)

First clinical research study: Single Tübinger-implants Al<sub>2</sub>O<sub>3</sub> (Schulte 1978)

Longest clinical research study: Retrospective data of 1608 i./981p. over 25y. Nobel Biocare implants (Balshi et al. 2013)

#RCT trials: 51 (9 in last 2 years)

First: 36p./43i, Ti-tps vs Ti\_HA +/- DFDB (Gher et al. 1994)

Largest: 208 p./ i. Straumann-SLA, after 3 weeks healing (Lang et al. (2007)

Longest follow up: 3 y. 93p/99i Osseospeed (Sanz et al. 2010) & (10 y. 72p/i. Osseotite, placement 10days after extraction (Schropp et al. 2010)

### Pre-surgery modifiers

General & local risk factors  
Bone quantity and quality (jaw)  
Vertical dimension of occlusion  
Parafunctional habits

### Surgery modifiers?

Flap / Site preparation  
Primary stability  
Residual infection  
Socket defect shape & facial plate integrity/thickness  
Facial position of the implant  
Soft tissue biotype

Skill of Clinician(s)

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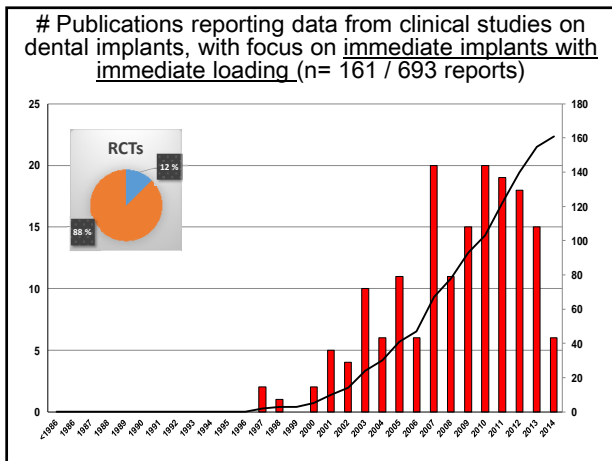
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**General findings, immediate implants with immediate loading**

**# Systematic reviews:** 9 (2 in last 2 years) *161 reports*

**First clinical research study:** 10p./130i, retrosp., edent.mand., Brånemark turned i. (Balshi & Wolfinger 1997)

**Longest clinical research study:** 7 y., retrosp., 80p/519i., edentulous jaws, 3i. Implants, (Testori et al. 2013)

**#RCT trials:** 18 (4 in last 2 years)

**First:** vs.:(ii+dI) 40p.(Crespi ea. 2008)–(i. autograft,heal 4 m., il),76p. (Block ea. 2009)

**Largest:** vs. Xenograft+membrane, heal 4m.,+il, 106p., single max. (Felice et al. 2011)

**Longest follow up:** 5 years 71p/120i, single posterior, (Prosper et al. 2010)

Pre-surgery modifiers	Surgery Modifiers?	Skill of Clinician(s)
General & local risk factors	Flap / Site preparation	Additional modifiers? Single implant vs. Splinted implants Occluding vs. Non-occluding Implant design, including length
Bone quantity/quality (jaw)	Primary stability	
Vertical dimension of occlusion	Residual infection	
Parafunctional habits	Socket defect shape & facial plate integrity/thickness	
	Facial position of the implant	
	Soft tissue biotype	

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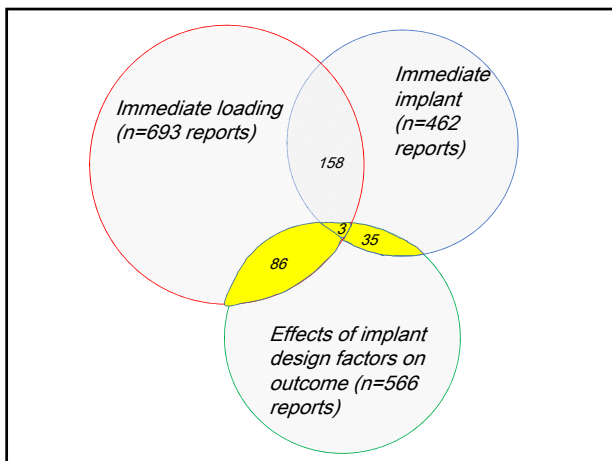
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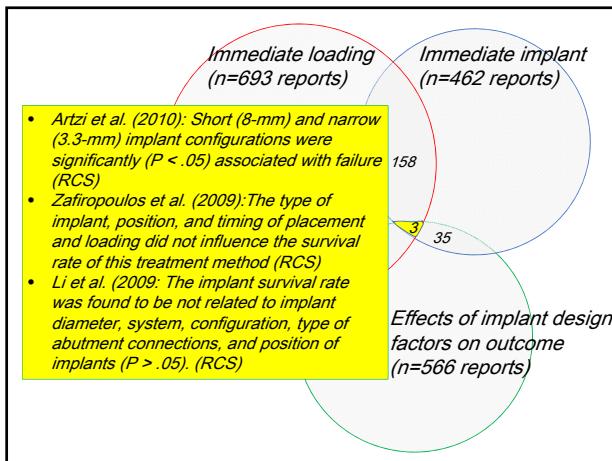
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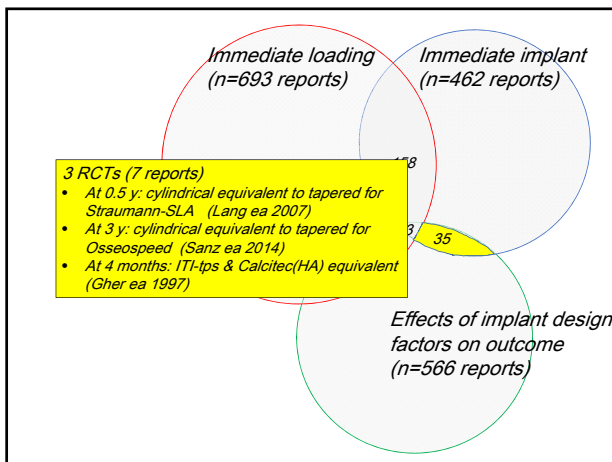
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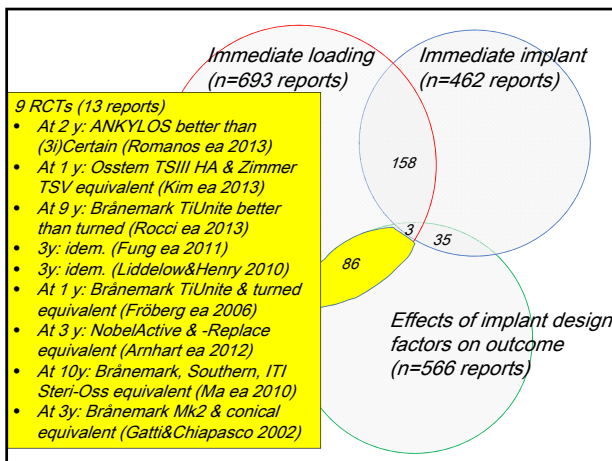
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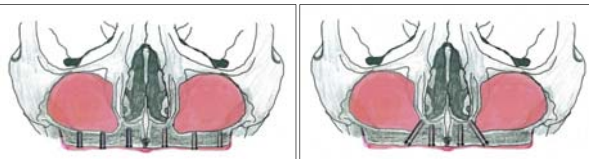
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Summit 2014

Edentulous maxilla, effects of implant design in rehabilitation, studies on immediate loading



	YES	NO		YES	NO
Design	Degidi & Piatelli 2003	Testori ea 2013 Li ea 2009	Design	Agnini ea 2014 Malo ea 2011a	Malo ea 2012 Cavalli ea 2012
Diameter	Degidi ea 2005	Testori ea 2013 Li ea 2009			Malo ea 2011b Agliardi ea 2009
Length	Kinsel & Liss 2007 Artzi ea 2010	vanAssche ea 2012 Testori ea 2013 Li ea 2009 Ibanez ea 2005	Diameter Length		
Surface			Surface		Pera ea 2014
Material			Material		

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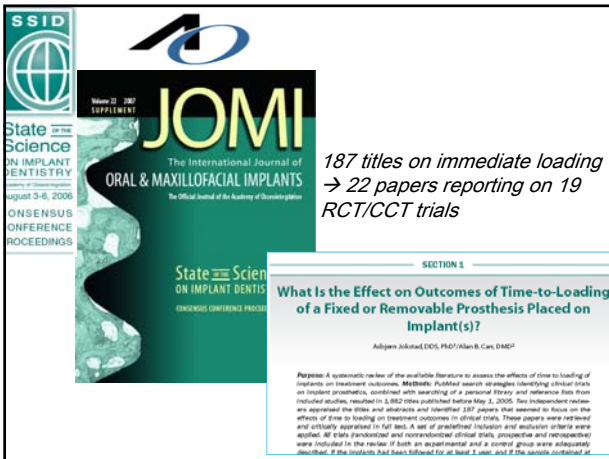
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SSID  
State of the Science ON IMPLANT DENTISTRY  
August 3-6, 2006  
CONSENSUS CONFERENCE PROCEEDINGS

**JOMI**  
The International Journal of ORAL & MAXILLOFACIAL IMPLANTS  
The Official Journal of the Academy of Oromaxillofacial Implants

187 titles on immediate loading  
→ 22 papers reporting on 19 RCT/CCT trials

SECTION 1  
**What is the Effect on Outcomes of Time-to-Loading of a Fixed or Removable Prosthesis Placed on Implant(s)?**  
Adigun, J.D., D.D.S., F.R.C.D., F.R.C.S., C.D., D.M.D.

Purpose: A systematic review of the available literature to assess the effects of time to loading of implants on treatment outcomes. Methods: PubMed search strategies identifying clinical trials on loaded prosthetics, combined with searching of a personal library and reference lists from included studies, resulted in 1,882 titles published before May 1, 2005. Two independent reviewers appraised the titles and abstracts and identified 187 papers that seemed to focus on the effects of time to loading on treatment outcomes in clinical trials. These papers were reviewed and initially separated in full text. A set of pre-defined inclusion and exclusion criteria were applied. All trials (randomized and nonrandomized clinical trials, prospective and retrospective) were included in the review if both an experimental and a control group were adequately described, if the results had been followed for at least 1 year, and if the sample contained at

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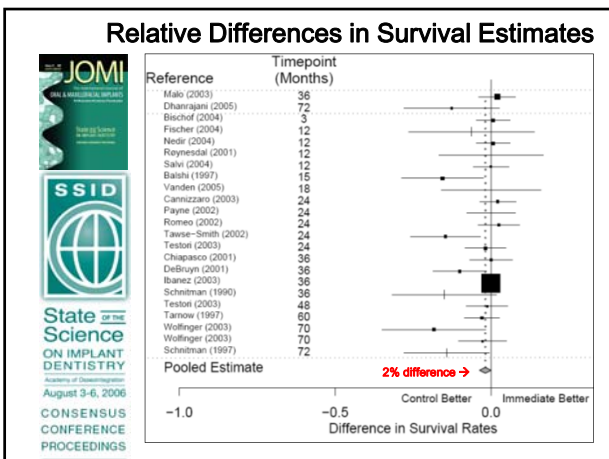
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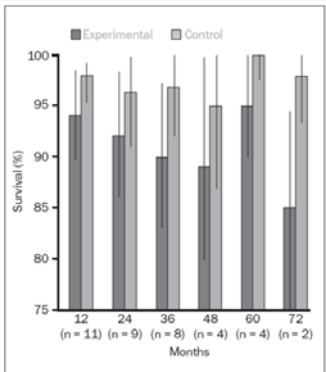
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### Relative Differences in Survival Estimates



~2% lower survival & consistently wider confidence intervals

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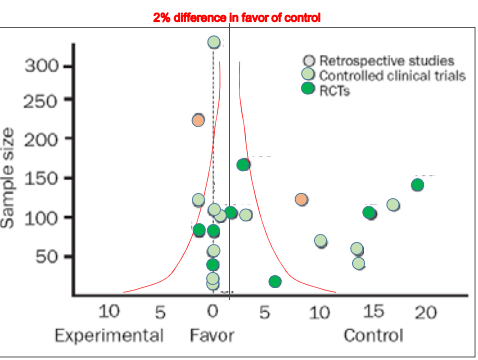
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### Implant morphology (smooth, microrough, rough)




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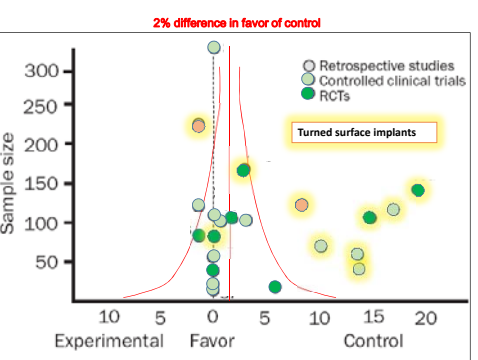
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### Implant morphology (smooth, microrough, rough)




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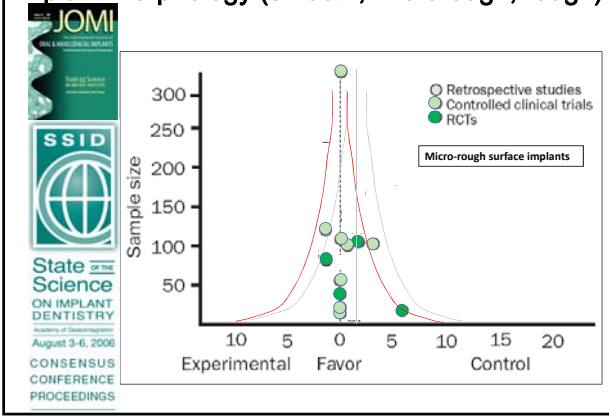
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### Implant morphology (smooth, microrough, rough)



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 GENERAL SESSION  
BOSTON, MASS., USA • MARCH 11-14, 2013

Thank you for your attention

Asbjørn Jokstad  
[asbjorn.jokstad@uit.no](mailto:asbjorn.jokstad@uit.no)

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