

# Quality of Dental Implants

Asbjørn Jokstad  
University of Toronto



## **Situation, end of 90'ies**

**The number of implants and implant systems increase continuously**

**FDI is concerned about the quality of all the new implants being marketed**

**FDI Science Committee commissioned a project to investigate the issue**



# What characterizes a good quality implant? When..

- there are clinical data over 3 ... 5 ... 10yrs?
- implant is made from cpTi grade 1 ... 3 ... 4?
- implant is rough ..etched ..groovy ...rounded ...connects internally ...sandblasted ...?
- the producer follows an ISO9001 standard?
- a well known researcher tells you so?
- a well known clinician tells you so?
- your sales rep tells you so?
- scientific clinical studies provide an answer?

# Scientific studies with similar aims:

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

Esposito et al. Interventions for replacing missing teeth: different types of dental implants. *Cochrane Database Syst Rev* 2002;(4). (version 1)

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

Eckert et al. Comparison of dental implant systems: quality of clinical evidence and prediction of 5-year survival. *Int J Oral Maxillofac Impl* 2005; 20: 406-15.

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# Interventions for replacing missing teeth with or without osseointegrated implants [protocol]

This protocol should be used for replacing missing teeth with or without osseointegrated implants.

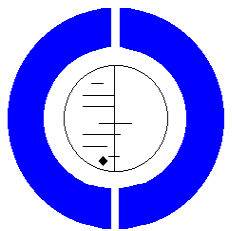
## Background

Missing teeth and supp... masticatory, phonetic f... showing that bone will... concept, termed osseo... past 20 years. A mult... implant retained prosth...

or replacing missing... ary, Issue 1, 2001.

ng restoration of... over 10 years... well-accepted... s in dentistry over the... osseointegrated

<b>Reviewer(s)</b>	Esposito M, Coulthard P, Worthington HV, Thomsen P
<b>Contribution of Reviewer(s)</b>	Paul Coulthard - data collection, assessment and analysis and final review Marco Esposito - data collection, assessment and analysis and final review Asbjorn Jokstad - data collection, assessment and analysis and final review Helen Worthington - statistical analysis and final review Peter Thomson - final review
<b>Issue protocol first published</b>	2000 Issue 3
<b>Date of most recent amendment</b>	30 August 2000

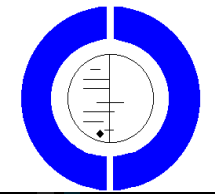


# Cochrane Oral Health Group

Since 2000: 10 systematic reviews completed on osseointegrated dental implants

Esposito M, Coulthard P, Worthington H, Thomson P / (Jokstad A)

Problem: Selection of studies to include



# Cochrane systematic reviews:

(Coulthard / Esposito & Worthington)

1. Zygomatic implants	0 RCT
2. Hyperbaric oxygen therapy	0 RCT
3. Use of prophylactic antibiotics	0 RCT
4. Perimplantitis	1 RCT
5. Preprosthetic surgery vs implants	1 RCT
6. Bone augmentation techniques	4 RCTs
7. Surgical techniques	4 RCTs
8. Immediate or conventional loading	5 RCT
9. Maintenance	5 RCTs
10. Characteristics of implants	12 RCTs



## Quality Assessment of Randomized Controlled Trials of Oral Implants

Marco Esposito, DDS, PhD<sup>1</sup>/Paul Coulthard, BDS, MFGDP, MDS, FDSRCS, PhD<sup>2</sup>/  
Helen V. Worthington, BSc, MSc, PhD, FIS<sup>3</sup>/Asbjørn Jokstad, DDS, PhD<sup>4</sup>

*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-FAC IMPLANTS 2001;16:783-792

IJOMI 2001;  
16: 783-92

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

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

International  
Dental  
Journal

6/03  
Supplement 2



Quality of Dental Implants

**fdi**  
Published by  
FDI World Dental Press

# Materials and methods

## 1. PICO:

Problem:	Intervention	Comparison	Outcomes
Claims of superiority	Implant characteristic (material, geometry, surface topography)	Implant without characteristic	Clinical relevant & Clinical significant

# Materials and methods

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Problem:	Intervention	Comparison	Outcomes
Claims of superiority	Implant characteristic (material, geometry, surface topography)	Implant without characteristic	Clinical relevant & Clinical significant

## All types of information sources:

*Scientific & quasi-scientific literature, WWW, promotional brochures and leaflets, CD/DVDs, trade exhibitions, etc.*

# Materials and methods

All information sources:

*Brochures, trade exhibitions, WWW, leaflets, presentations, etc.*

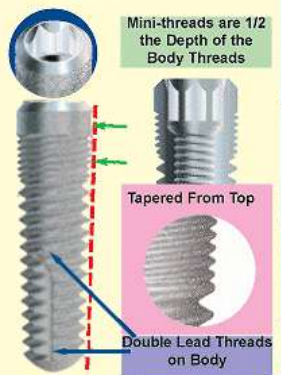
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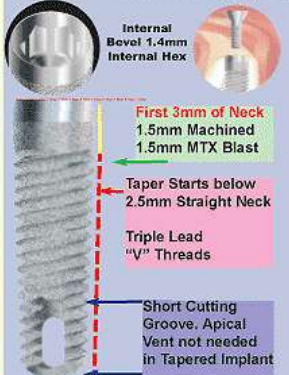


## Compare ScrewPlant to Zimmer's \*Screw-Vent®

- ### ScrewPlant Implant
- SBM Blasted Surface to Top
  - Mini-Threads + Double-lead Threads
  - Body Taper starts at Top for Expansion
  - Long Cutting Groove - No Vent
  - Fixture-Mount is Transfer & can be Shorten for Final Abutment
- US List Price: \$150 Complete**  
Healing Collar (2mm) + Abutment with machined margin & Comfort Cap



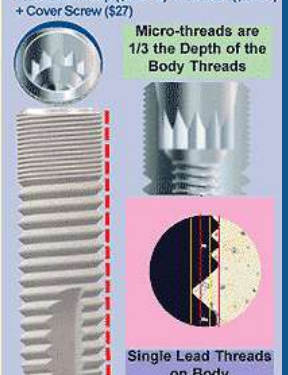
- ### Screw-Vent Implant
- Machined Surface 1.5mm from Top
  - Triple Lead Threads overall
  - Body Taper starts 2.5mm from Top
  - Short Cutting Groove & Vent
  - Fixture-Mount is Transfer & can be Shorten for Temporary Abutment
- US List Price: \$512 Complete**  
Implant (\$325) + Healing Collar (\$42) + Abutment with machined margin (\$145)



\*Screw-Vent® is a Register Trademark of Zimmer Dental Inc. Screw-Vent® implants are sold Exclusively by Zimmer Dental Inc.

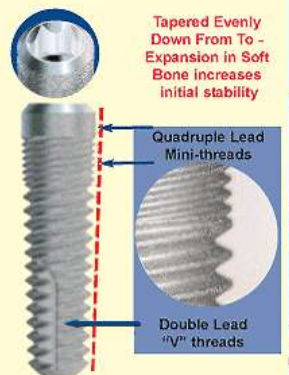
## Compare ScrewPlant to Astra Implant

- ### Astra Implant
- TO<sub>2</sub> Blasted Surface to Top
  - Micro-threads + Single-lead Threads
  - Straight Body. Optional implant only provides taper in Micro-Thread area
  - Fixture-Mount fictional engagement Counter-torque needed to remove
  - Fixture Mount serves single purpose
- US List Price \$537.50 Complete:**  
Implant(\$295) + Healing Collar (\$50) + Abutment /Cap (\$140.75) + Transfer (\$24.75) + Cover Screw (\$27)



## Compare ScrewPlant to 3i's™ Certain\* Implant

- ### ScrewPlant Implant
- SBM Blasted Surface 20u pits
  - Mini-Threads + Double-lead Threads
  - Body Taper starts at Top
  - Internal Hex 2mm Deep x 2.5mmD
  - Angled Abutments Indexed to Hex
- US List Price: \$150 Complete**  
Includes Healing Collar, Straight Abutment, Snap-on Cap and Transfer



- ### 3i Certain™ Implant
- Acid Etched Osseotite 1-2u Pits
  - Minimal Thread Surface
  - Body Tapers from mid-point
  - Internal Hexes 3mmD & 2.5mmD
  - No Indexing - need Encode™ Collars
- US List Price: \$536 Complete**  
Implant (\$319) + Healing Collar (\$45) + Abutment (\$147) + Cap (\$13) + Transfer (\$12)

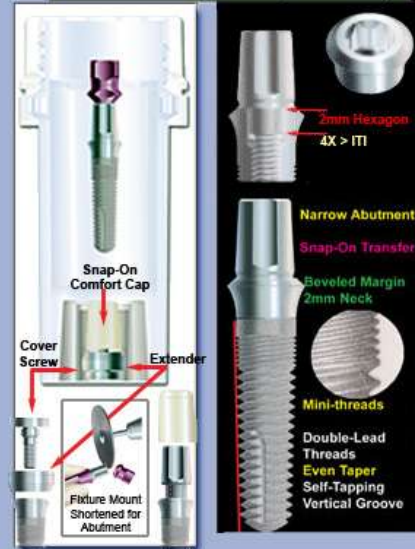


## ScrewPlus Implant vs Straumann's ITI Tapered Implant

- ### ScrewPlus Implant Packaging Includes
- Fixture Mount (Transfer and Final Abutment)
  - Cover Screw, 2mm Extender and Snap-on Comfort Cap

- ### Straumann ITI Tapered Implant Includes Cover Screw Only

### COMPARE US PRICES



Compare US List Price	ITI Tapered Implant	Screw Plus Implant
Implant	\$305.00	\$150
Cover Screw	\$34.50	Included
Healing Cap	\$48.00	2mm Included
Straight Abutment	\$129.00	Included
Protective Cap	\$7.50	Included
Transfer	\$7.50	Included
<b>TOTAL US List Price</b>	<b>\$521</b>	<b>\$150</b>
<b>SAVINGS</b>	<b>3.5X</b>	<b>71%</b>

ITI is a Registered Trademark of Straumann Company

## Implant Direct's RePlant™ VS Nobel's \*Replace Select

**SURGICAL AND PROSTHETIC COMPATIBILITY**  
RePlant Implant is inserted with Nobel \*Replace Surgical Instruments  
RePlant Platform is Compatible with Nobel \*Replace Abutments

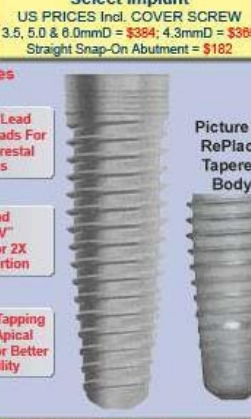
### PRICE COMPARISON - SAVE 60% FOR STRONGER, BETTER DESIGN

4mm Deep Tri-lobe Internal Connection

**Implant Direct RePlant Implant**  
US PRICES Incl. COVER SCREW  
3.5, 4.5, 5.0 & 6.0mmD = \$150  
Straight Snap-On Abutment = \$75

**Nobel \*Replace Select Implant**  
US PRICES Incl. COVER SCREW  
3.5, 5.0 & 6.0mmD = \$364; 4.3mmD = \$365  
Straight Snap-On Abutment = \$182

1.5mm Deep Tri-lobe Internal Connection



**TITANIUM ALLOY FOR STRENGTH (SBM SURFACE)**

**CP TITANIUM WITH \*TIUNITE SURFACE (Alloy on HA)**

\*RePlace Select and Ti Unite are Trademarks of Nobel Biocare Inc.

# Materials and methods

All information sources:

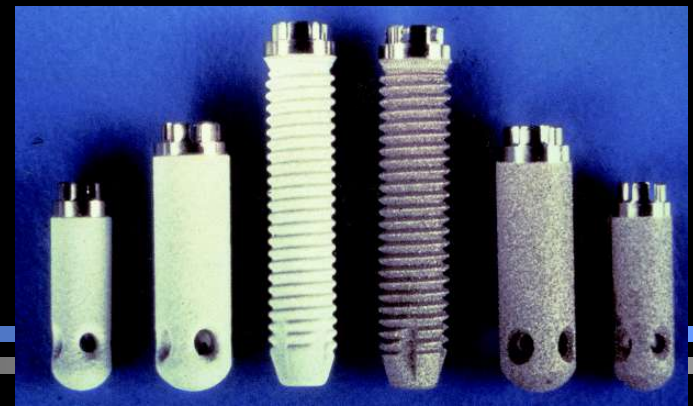
*Brochures, trade exhibitions, WWW, leaflets, presentations, etc.*

PICO:

Problem:	Intervention	Comparison	Outcomes
Claims of superiority	<b>Implant characteristic</b> (material, geometry, surface topography)	<b>Implant</b> without characteristic	<b>Clinical relevant &amp; Clinical significant</b>

## Differences in implant material:

- C.p.1 Titanium (e.g. Nobel Biopharma)
- C.p.2 Titanium
- C.p.3 Titanium (e.g. Straumann)
- C.p.4 Titanium (e.g. AstraTech)
- Titanium-alloys (e.g. C.p.5: Ti-6Al-4V)
- Hydroxyapatite
- ....





# Differences in implant body geometry:

- Major morphological form
- Flange design
- Main body w/ wo/ threads
- Apex form, grooves & vents
- Interface geometry
- Surface topography





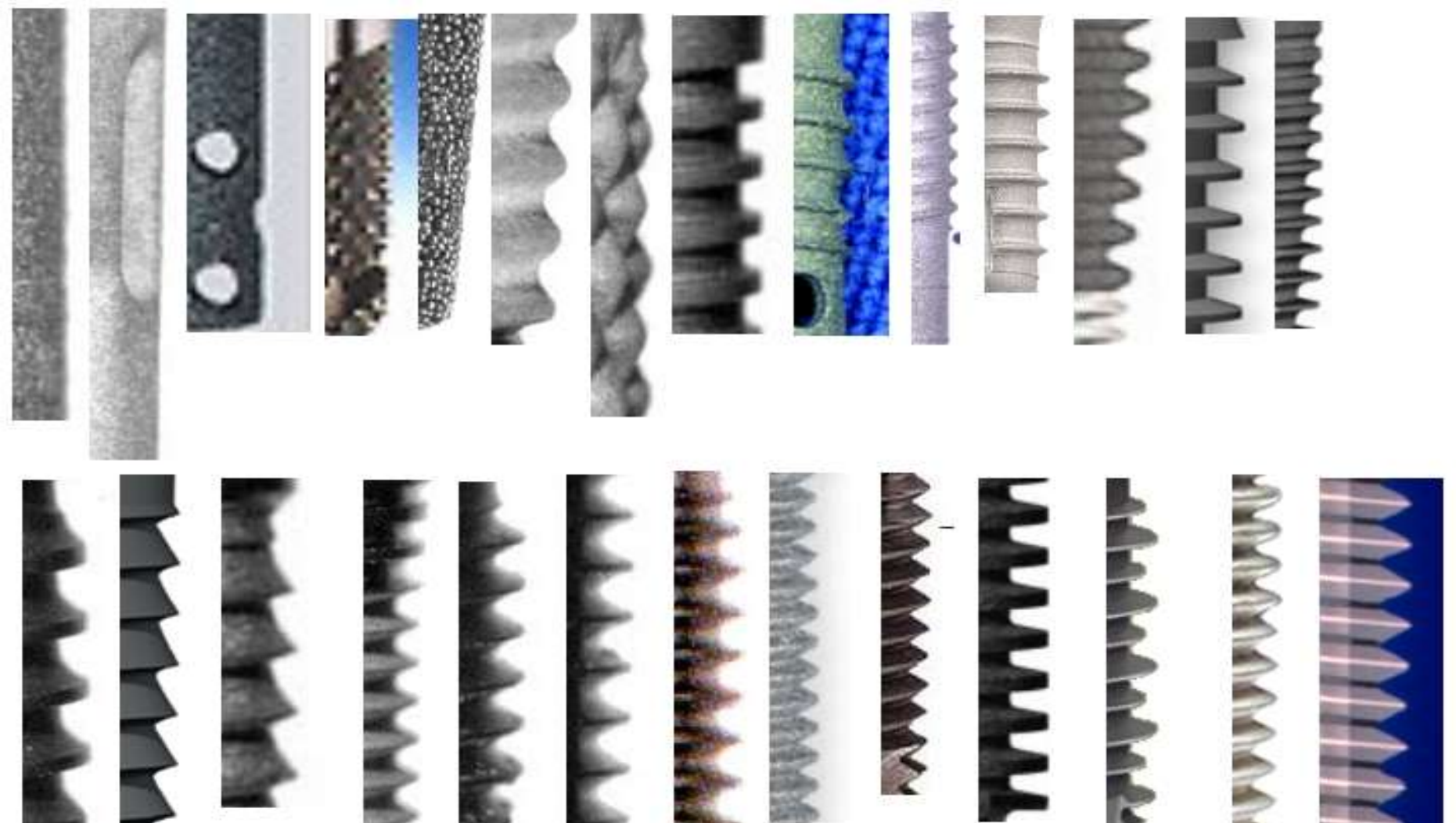
**Straight, Tapered, Conical, Ovoid, Trapezoidal, Stepped & combinations ...**



# 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 ....

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

# Materials and methods

All information sources:

*Brochures, trade exhibitions, WWW, leaflets, presentations, etc.*

PICO:

Problem:	Intervention	Comparison	Outcomes
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# Claims of improved clinical outcomes

1. Ease of placement
2. Osseointegration
3. Esthetics
4. Peri-implant mucositis
5. Marginal bone loss
6. Mechanical problems of the implant-abutment-superstructure connections
7. Mechanical failing of dental implants

# Materials and methods

1. *PICO: Comparative elements*
2. *Information presented by manufacturers*
3. *Evidence in the scientific literature*
  - *Category A1, clinically controlled trial with patient randomization (RCT)*
  - *Category A2, clinically controlled trial with split-mouth randomization, (Split-mouth RCT)*
  - *Category B, (prospective) clinically controlled trial without randomization (CCT)*
  - *Category C, clinical study applying any other study design than A or B (e.g. retrospective cohort, case-series, case-controls, etc.).*

**Cochrane, ISI, Medline, Embase, IADR abst.,etc**

# Results

N=1270





# **Commercially available implant and implant systems in October 2003:**

**225 implant brands**

**78 manufacturers – from all continents**

**~70 implant brands no longer marketed**

**Clinical documentation:**

**from none to extensive**



# 126 clinical studies related outcome to implant characteristics (material, geometry, surface topography)

	RCTs	CCTs	Other	
1. Ease of placement	4	3	0	7
2. Osseointegration	25	3	21	49
3. Esthetics	1	1	0	2
4. Peri-implant mucositis	21	0	3	24
5. Marginal bone loss	19	6	2	27
6. Mechanical problems of the implant- abutment- superstructure connection	6	1	6	13
7. Mechanical failing of dental implant	1	1	2	4
	77	15	34	126

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49 clinical studies related a specific implant characteristic to the outcome: osseointegration

	<b>RCTs</b>	<b>CCTs</b>	<b>Other</b>	
<b>Implant geometry</b>	<b>4</b>	<b>-</b>	<b>8</b>	<b>12</b>
<b>Implant material</b>	<b>3</b>	<b>-</b>	<b>2</b>	<b>5</b>
<b>Implant surface</b>	<b>5</b>	<b>-</b>	<b>1</b>	<b>6</b>
<b>Complex study design</b>	<b>13</b>	<b>3</b>	<b>10</b>	<b>26</b>
	<b>25</b>	<b>3</b>	<b>21</b>	<b>49</b>

Has this report  
led to  
anything?



# Quality of Dental Implants

## Background

More than 220 implant brands produced by about 80 manufacturers are commercially available worldwide. These are made from different materials, undergo different surface treatments and manifest in different shapes, lengths, widths and forms. The clinician can in theory choose among more than 2000 implants.

FDI recognizes that:

- Implants made from titanium and titanium alloys appear to perform well clinically in properly surgically prepared bone, regardless of small variations in design.
- The scientific evidence of the influence of dental implant material, geometry and surface topography on their clinical performance is limited and the study methodology is not strong. Hence there is inconclusive evidence for promoting specific implants or implant systems over others.
- Implants are manufactured and sold in some parts of the world without compliance to international standards.

It would seem prudent to only use dental implants supported by sound clinical research documentation and which conform to the general principles of good manufacturing practice in compliance with the ISO Standards or FDA (Food and Drug Administration) and other regulatory bodies.

- Most clinical trials on dental implants focus on criteria relative to peri-implant aspects over relatively short observation periods. Such criteria are only surrogate measures for treatment outcome from the patient and general public perspectives.

Submitted by: FDI Science Committee

Reference: FDI Science Committee Project 5-98: Jokstad A, Bragger U, Brunski JB, Carr AB, Naert I, Wennerberg A. Quality of Dental Implants. *International Dental Journal*, 2003; 53: Suppl 3:409-443.

*Adopted by the FDI General Assembly  
12th September 2004 – New Delhi*

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- Resources Home
- Guidelines
- Facts and Figures
- Publications
- Continuing Education
- Dental Schools
- Implant Manufacturers

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- Activities
- Global Oral Health
- Tobacco
- Fluoride
- Public Health Committees
- Partners
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- Congress & Partners Home
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**Latest News from the World Dental Federation**

**FDI supports World Health Day 2005**

Oral health is important to mother and child health...read the full text and

**2006 Annual World Dental Congress**

The Congress will take place in Shenzhen, China. Le Congrès se déroulera à

**2005 Montréal Congress**

Dates: 24th -27th August  
Venue: Palais des Congrès

ON-LINE REGISTRATION!!



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## Implant Manufacturers

A part of the FDI Science Commission Project 98-5 titled "Quality of Dental Implants" is to present this continuously updated list of implant manufacturers worldwide. The full report is published as a separate supplement to the International Dental Journal: Jokstad A, Braegger U, Brunski JB, Carr AB, Naert I, Wennerberg A. Quality of Dental Implants. Int Dent J, 2003; 53 Supplement 2: 409-33.

Please click on the link below to launch the list.

[→ Implant Manufacturers](#)



Implant manufacturers

Jokstad, Brägger, Brunski, Carr, Naert,  
Wennerberg.

*Int Dent J 2003; 53 Sup 2: 409-33*

&

*Int J Prosthodont 2004;*

*17: 607-41*

# The "Groovy implant"

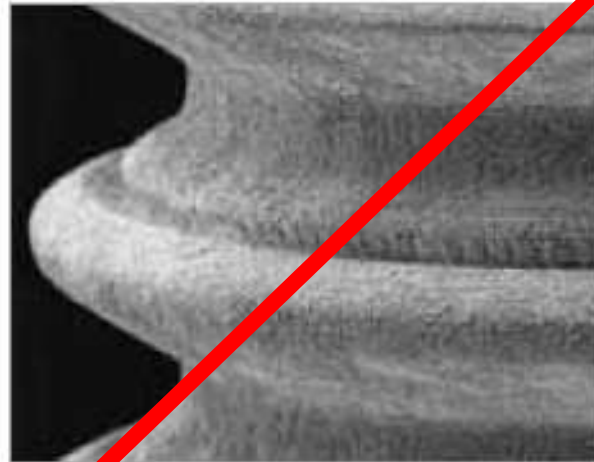
## Feeling Groovy

In 2005, Nobel Biocare took the complete range of TiUnite® implants to a new level of effectiveness with the introduction of the Groovy™ technology. As a further step towards shorter healing times and safer implant treatment, Nobel Biocare added a groove of optimal dimensions to the thread of the implants. The combined effect of TiUnite® and the groove is a favorable environment that stimulates faster bone growth within and along the groove. The result is not only further enhancement of the rate of osseointegration, but also up to 30 percent higher implant stability due to increased mechanical interlock between the bone and the implant.

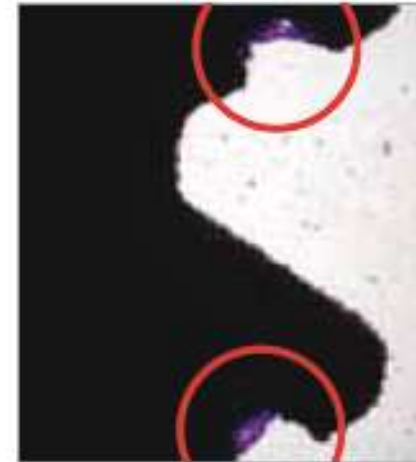
## Benefits of Grooves Incorporated onto the Thread of the Implant:

- > Up to 30 percent higher stability
- > Enhanced osseointegrative properties leading to higher biomechanical stability
- > Bone forms more rapidly along the grooves compared to the rest of the implant
- > Particularly effective in soft bone

30%



> **GROOVY IMPLANT**  
The groove at the thread takes the TiUnite® implants to a new level of effectiveness.



> **GROOVY BONE FORMATION**  
Faster bone growth within the groove results in enhanced rate of osseointegration and biomechanical stability.



APR 19 2005

K050258

#### 1.4 510(k) Summary of Safety and Effectiveness

Submitted by: Herbert Crane  
Manager, Regulatory Affairs

Address: Nobel Biocare USA LLC  
22715 Savi Ranch Parkway  
Yorba Linda, CA 92887

Telephone: (714) 282-4800, ext. 7830

Facsimile: (714) 282-9023

Date of Submission: February 2, 2005

Classification Name: Endosseous Implant (21 CFR 872.3640)

Trade or Proprietary or Model Name: Groovy Implants

Legally Marketed Device(s): Nobel Biocare Endosseous Implants (K041661)

2.Feb 2005:  
510K Application





### Indications for Use:

Nobel Biocare's Groovy Implants are root-form endosseous implants intended to be surgically placed in the bone of the upper or lower jaw arches to provide support for prosthetic devices, such as an artificial tooth, in order to restore patient esthetics and chewing function. Nobel Biocare's Groovy Implants are indicated for single or multiple unit restorations in splinted or non-splinted applications. Nobel Biocare Groovy Implants may be placed immediately and put into immediate function providing that the initial stability requirements detailed in the surgical manuals are satisfied.

Groovy implants are indicated for use in soft bone in posterior regions or whenever immediate or early

***...bone forms more rapidly in the groove than on other parts of the implant resulting in increased stability when compared to non-grooved implants.***



[Hall J.](#), [Miranda-Burgos P.](#), [Semmerby L.](#)

Nobel Biocare AB, Goteborg, Sweden. [jan.hall@nobelbiocare.com](mailto:jan.hall@nobelbiocare.com)

**Purpose:** *Study if bone formation and implant stability were influenced by 110  $\mu$ m and 200  $\mu$ m and 70  $\mu$ m deep grooves positioned at a thread flank*

**M&M:** 18 rabbits – 6 x 7 mm implants



9: 3 control impl. + 3 test impl. (110  $\mu$ m wide & 70 $\mu$ m deep)

9: 3 control impl. + 3 test impl. (200  $\mu$ m wide & 70 $\mu$ m deep)



6 weeks  $\rightarrow$  Removal torque (RTQ) (2 control impl. vs 2 test impl.)

$\rightarrow$  Histology (1 control impl. vs 1 test impl.) “bone-fill”

**Results:**

RTQ

% bonefill

110x70  $\mu$ m grooves +30% p< 0.05 (36) p< 0.05 (18) vs. control

200x70  $\mu$ m grooves + 8% p< 0.05 (36) p< 0.05 (18) vs. control

**Conclusion:** *“The 110 micron-wide groove was shown to increase the resistance to shear forces significantly. It is suggested that implants with such a groove may be one way to optimize implant stability in suboptimal clinical conditions.”*



Nobel Biocare AB  
C/O Mr. Herbert Crane  
Manager, Regulatory Affairs  
Nobel Biocare USA, LLC  
22715 Savi Ranch Parkway  
Yorba Linda, California 92887

Food and Drug Administration  
9200 Corporate Boulevard  
Rockville MD 20850

APR 19 2005

Re: K050258

Trade/Device Name: Groovy Implants  
Regulation Number: 21 CFR 872.3640  
Regulation Name: Endosseous Implant  
Regulatory Class: II  
Product Code: DZE  
Dated: February 2, 2005  
Received: February 3, 2005

19. April 2005:  
510K Approval

Dear Mr. Crane:

We have reviewed your Section 510(k) premarket notification of intent to market the device referenced above and have determined the device is substantially equivalent (for the indications for use stated in the enclosure) to legally marketed predicate devices marketed in interstate commerce prior to May 28, 1976, the enactment date of the Medical Device Amendments, or to devices that have been reclassified in accordance with the provisions of the Federal Food, Drug, and Cosmetic Act (Act) that do not require approval of a premarket approval application (PMA). You may, therefore, market the device, subject to the general controls provisions of the Act. The general controls provisions of the Act include requirements for annual registration, listing of devices, good manufacturing practice, labeling, and prohibitions against misbranding and adulteration.



World Science West Conference 2005

## Coronal Ridge Reconstruction

- Labial soft tissue support
- Papillary support
- Scalloped shape
- Emergence profile
- Color, texture of soft tissue



MGM Arena, Las Vegas



2 Feb 2005:  
Application



19 April 2005:  
Approval



6 June 2005:  
World Premiere!

“ Welcome to **Dentium Dental Implant System**: Since the establishment of Dentium in the USA in 2004, we have been manufacturing high quality dental implant products. Our extensive clinical documentation and research have lead to the development of an innovative, simple, and versatile dental implant system...”

The screenshot shows the Bromedcare website interface. At the top right, there are navigation links: HOME, MY ACCOUNT, SHOPPING CART, and E-MAIL. Below this is a green navigation bar with links: ONLINE SHOP, ABOUT COMPANY, CONTACT US, WHAT'S NEW, SUPPORT, and EDUCATION. The main header features the Bromedcare logo and the tagline "Beautiful Life Implant System".

On the left side, there is a vertical menu with the following categories:
 

- **Implantium One**
  - Design Features of Implantium One
  - Fixture & Surgical Drill Matching System
- **Procedure Guide**
  - Drilling Sequence Guide
  - Drilling Depth Guide
  - Surgical Drilling Procedure
- **Surgical Procedures**
- **Dual Abutment Procedure**
- **Prosthetic Procedure**
  - Dual / Dual Milling
  - Angled
  - EsConia™
  - Plastic Temporary
  - Direct Casting
- **Screw Abutment Procedure**
- **Overdenture Procedure**

The main content area is titled "Design Features of *Implantium One*". It features a large image of a dental implant with a crown, labeled with letters A through G. To the right of this image are two detailed views:
 

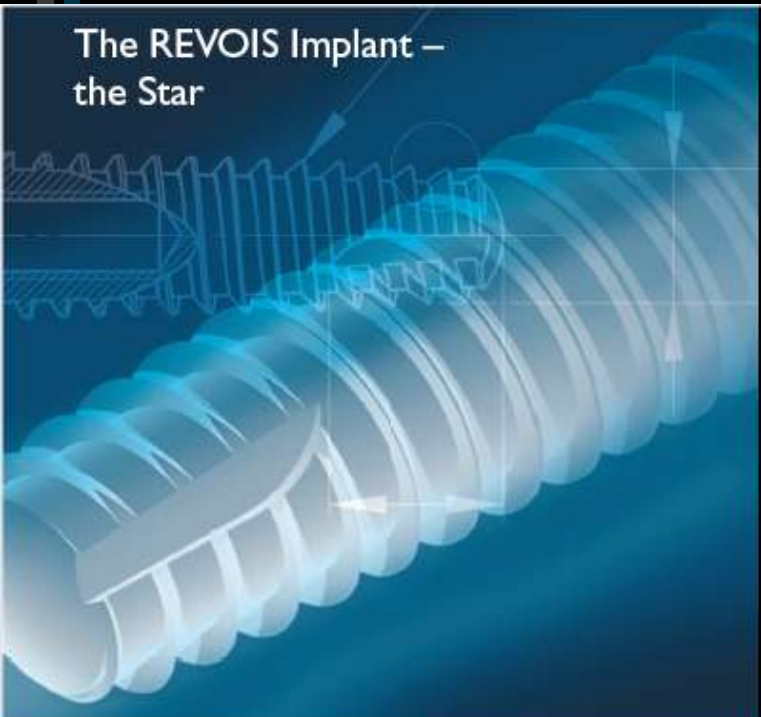
- A. Abutment TiN-Coating**: Shows four different abutment designs with a gold-colored TiN coating. Below the image is the text: "Esthetic gold color with TiN-coating".
- B. Optimal Fixation Screw**: Shows two screw designs: "Regular Platform" and "Wide Platform". Below the images are two bullet points:
  - ◆ Synchronized spiral neck thread,
  - ◆ Initial stability & maximum sealing between the cortical bone and fixture.

At the bottom right corner of the page, there is a small blue checkmark icon.



# New implants since Oct 2003:

The REVOIS Implant – the Star



**REVOIS**  
THE REVOLUTIONARY IMPLANT SYSTEM

## Willkommen bei Z-Systems

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

World's first certified  
Dental Zirconiumoxide Implants



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





Thank you for your kind  
attention