



American Association of Oral and Maxillofacial Surgeons  
2013 Dental Implant Conference

December 5-7, 2013 ♦ Sheraton Chicago Hotel & Towers

## **G02: Transitioning the Patient with Dental Implants**

12/6/2013


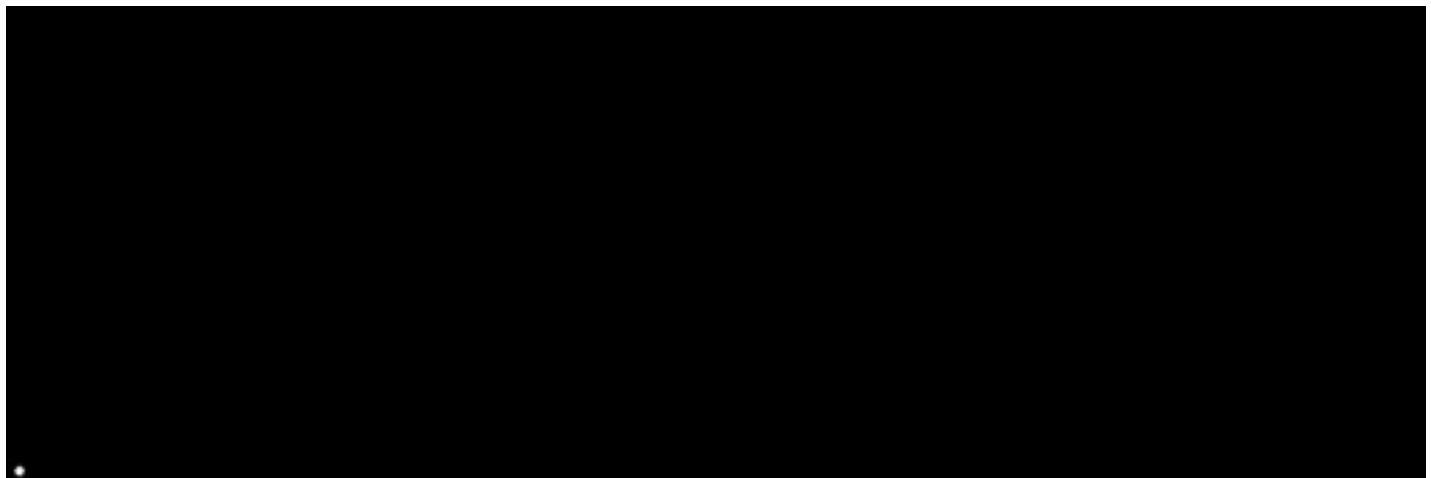
1:00PM - 4:30PM

***Digital Intraoral Scanning and CAD CAM Abutments. Applications for Full Arch Restorations including Hybrid Designs***

by


**Dr. E. Karateew**

**WARNING:** Consider file size/number of pages before printing.  
We recommend saving this document to your device, if possible.



**DIGITAL INTRAORAL SCANNING AND  
CAD/CAM ABUTMENTS:  
APPLICATIONS FOR FULL ARCH RESTORATIONS  
INCLUDING HYBRID DESIGNS**

E. DWAYNE KARATEEW  
DDS, CERT PERIO, CERT PROSTH



**LEARNING AND INNOVATION GO HAND IN HAND. THE  
ARROGANCE OF SUCCESS IS TO THINK THAT WHAT YOU DID  
YESTERDAY WILL BE SUFFICIENT FOR TOMORROW.**

WILLIAM POLLARD



# ~~THE DIGITAL PLAYGROUND~~

AAOMS-DENTAL IMPLANT CONFERENCE  
CHICAGO, ILL.  
DECEMBER 5-6-7, 2013

# ~~THE DIGITAL PLAYGROUND~~

WHERE BIOLOGY MEETS TECHNOLOGY



**EVIDENCE BASED  
PRACTICE**

**EVIDENCE-BASED PRACTICE (EBP): ALL PRACTICAL DECISIONS MADE SHOULD**

- 1. BE BASED ON RESEARCH STUDIES**
- 2. THESE RESEARCH STUDIES ARE SELECTED AND INTERPRETED ACCORDING TO SOME SPECIFIC NORMS, IGNORING THEORETICAL AND QUALITATIVE STUDIES AND CONSIDER QUANTITATIVE STUDIES.**

HJORLAND B. EVIDENCE BASED PRACTICE: AN ANALYSIS BASED ON THE PHILOSOPHY OF SCIENCE. JOURNAL OF THE AMERICAN SOCIETY FOR INFORMATION SCIENCE AND TECHNOLOGY, 2011 62(7), 1301-1310.

**EVIDENCE BASED  
TREATMENT**

**EVIDENCE BASED TREATMENT (EBT) TRIES TO IDENTIFY THE EVIDENCE THAT THERE MAY BE FOR A PRACTICE AND RATING IT ACCORDING TO HOW SCIENTIFICALLY SOUND IT MAY BE.**

**ITS GOAL IS TO ELIMINATE UNSOUND OR EXCESSIVELY RISKY PRACTICES IN FAVOR OF THOSE THAT HAVE BETTER OUTCOMES.**

**IT ENCOURAGES PROFESSIONALS TO USE THE BEST EVIDENCE POSSIBLE- THE MOST APPROPRIATE INFORMATION AVAILABLE.**

HJORLAND B. EVIDENCE BASED PRACTICE: AN ANALYSIS BASED ON THE PHILOSOPHY OF SCIENCE. JOURNAL OF THE AMERICAN SOCIETY FOR INFORMATION SCIENCE AND TECHNOLOGY, 2011 62(7), 1301-1310.

PROCEDURE OF SYSTEMICALLY FINDING, APPRAISING AND USING  
RESEARCH AS THE BASIS FOR OUR CLINICAL PRACTICE

INTEGRATION OF:

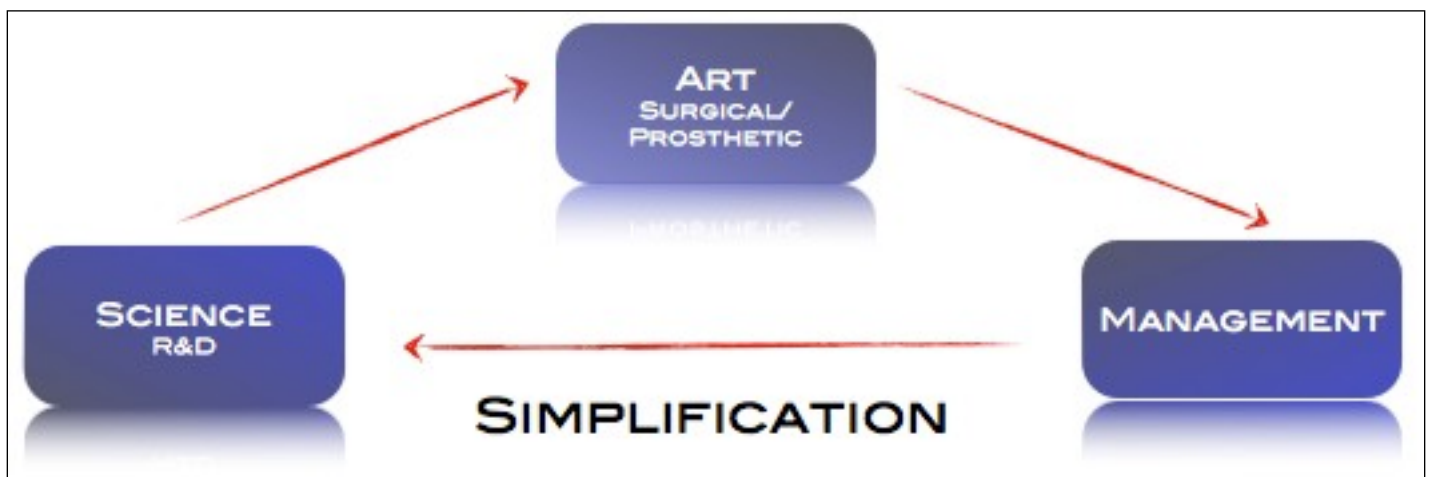
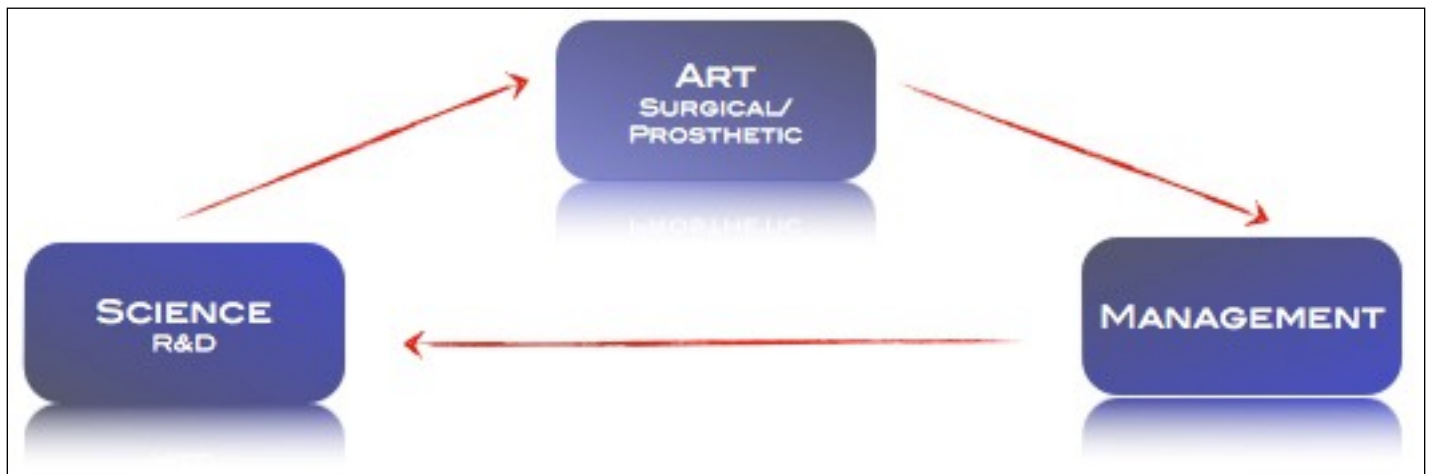
1. OUR CLINICAL EXPERTISE/EXPERIENCE
2. THE BEST AVAILABLE EXTERNAL CLINICAL RESEARCH EVIDENCE
3. PATIENTS WISHES

SCIENCE  
R&D

ART  
SURGICAL/  
PROSTHETIC

SCIENCE  
R&D

PROSTHETIC



PARAMETERS AND KEY FACTORS FOR OPTIMUM PROSTHETICS

1. HARD TISSUE AROUND IMPLANTS

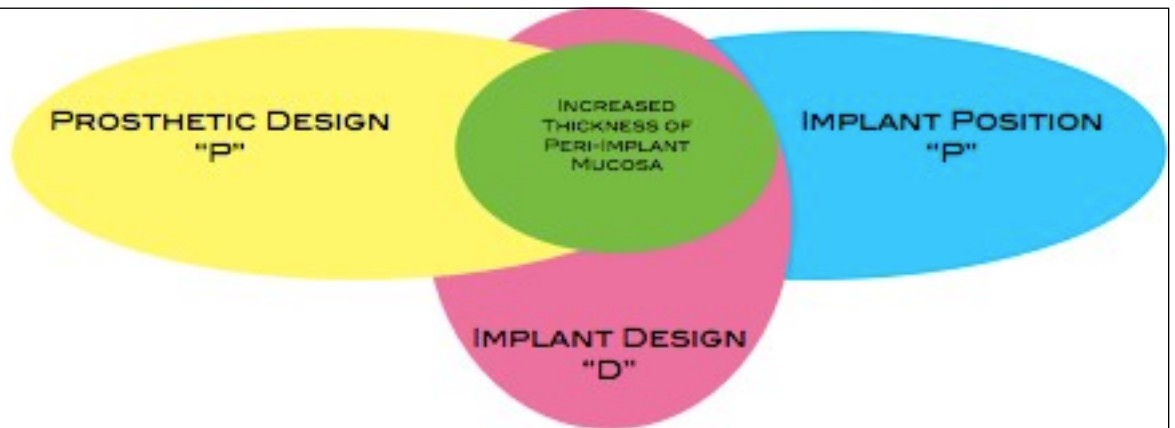
i) VOLUME ii) TOPOGRAPHY

2. SOFT TISSUE AROUND THE TRANSGINGIVAL COMPONENTS

i) VOLUME ii) COLOR

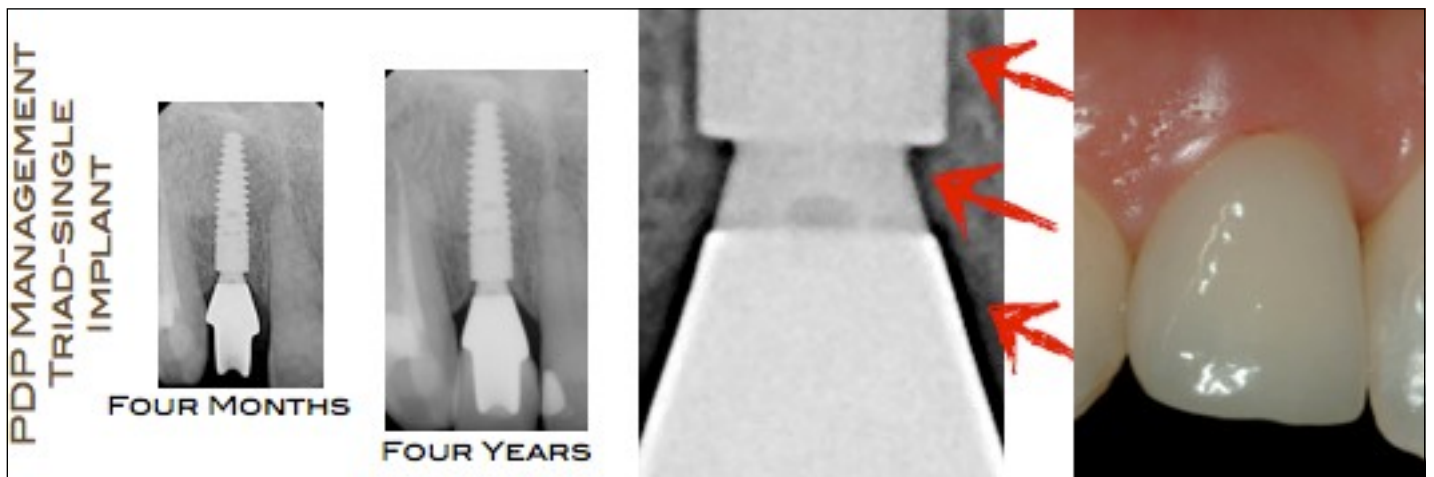
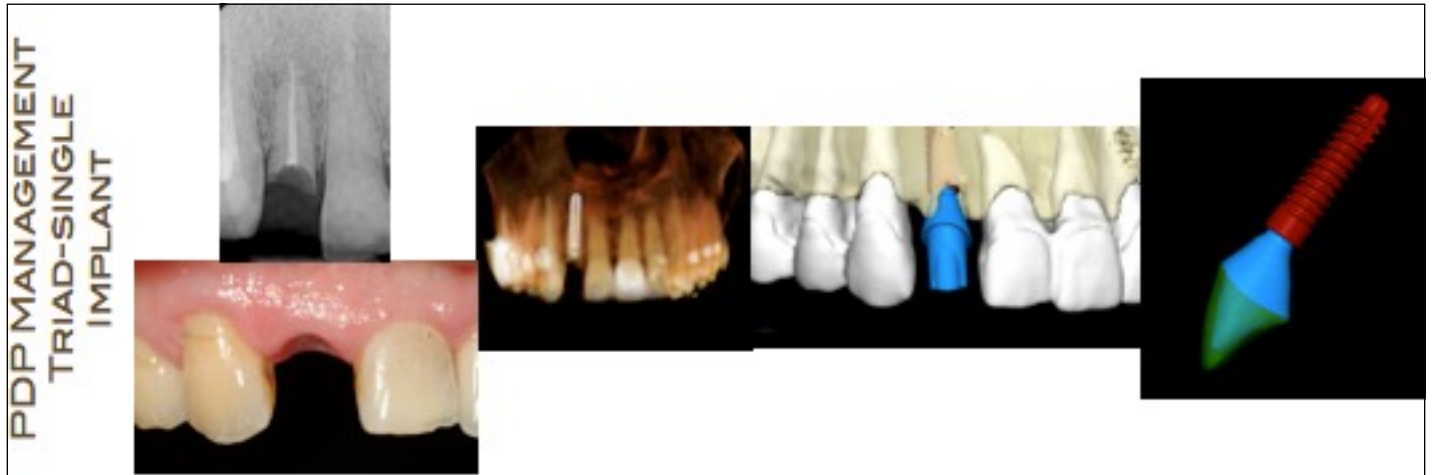
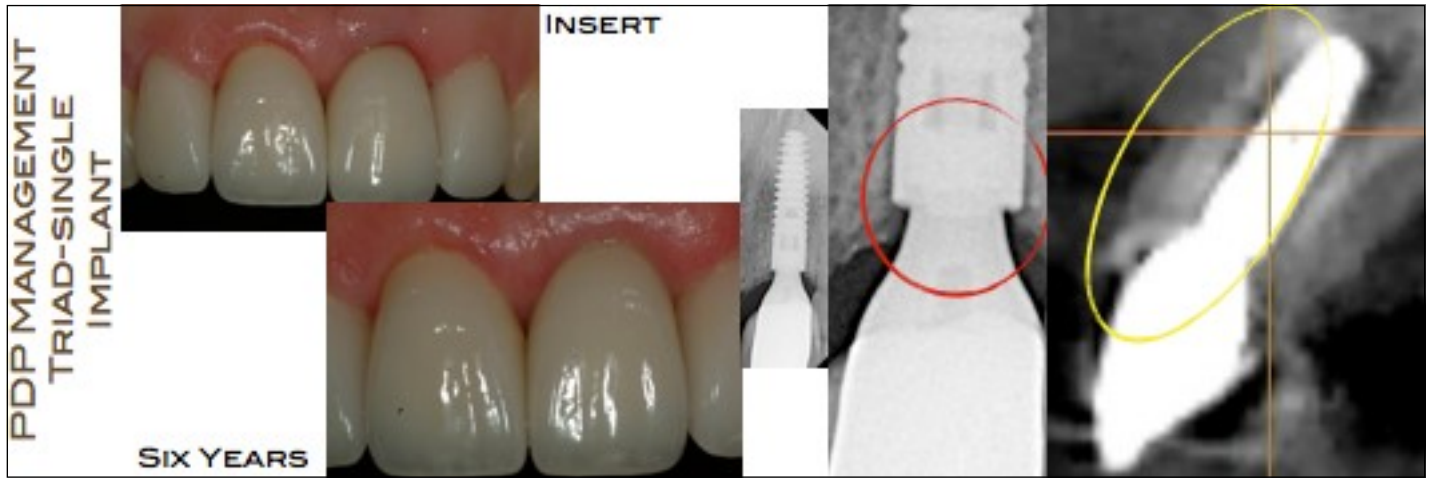
3. SOFT TISSUE AROUND THE FINAL RESTORATIONS

4. PINK AND WHITE AESTHETICS



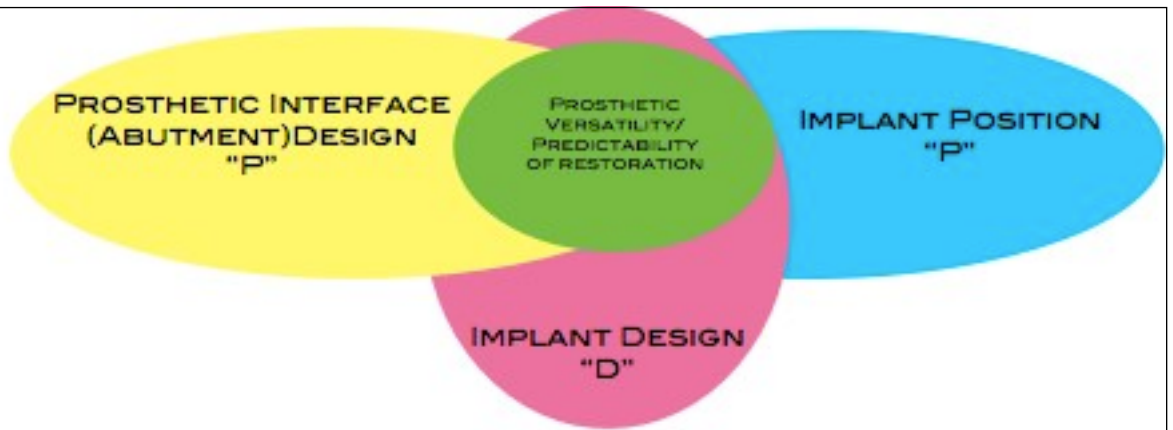
FU J, LEE A, WANG H-L. INFLUENCE OF TISSUE BIOTYPE OF IMPLANT AESTHETICS  
INT J ORAL MAXILLOFAC IMPLANTS 2019;26:499-508







**PDP MANAGEMENT  
TRIAD-FULL ARCH**



ADAPTED FROM: FU J, LEE A, WANG H-L. INFLUENCE OF TISSUE BIOTYPE OF IMPLANT ESTHETICS. INT J ORAL MAXILLOFAC IMPLANTS 2011;26:699-508.

**REALITIES AND  
CHALLENGES**



**REALITIES AND  
CHALLENGES**



REALITIES AND CHALLENGES



FIELDS H JR, BIRTLES JT, SHAY J. COMBINATION PROSTHESIS FOR OPTIMUM ESTHETIC APPEARANCE. J AM DENT ASSOC. 1980 AUG;101(2):276-9.  
SILVERMAN SL. DIFFERENTIAL DIAGNOSIS: FIXED OR REMOVABLE PROSTHESIS. DENT CLIN NORTH AM. 1987 JUL;31(3):347-62.  
JEMT T, LEKHOLM U. IMPLANT TREATMENT IN EDENTULOUS MAXILLAE: A 5-YEAR FOLLOW-UP REPORT ON PATIENTS WITH DIFFERENT DEGREES OF JAW RESORPTION. INT J ORAL MAXILLOFAC IMPLANTS. 1995 MAY/JUN;10(3):303-11.

DEFINING THE PROBLEM



OCCLUSAL TABLE

IMPLANT FIXTURES

PROSTHETIC GYMNASTICS



OCCLUSAL TABLE

"PROSTHETIC GYMNASTICS"

ABUTMENT

IMPLANT FIXTURES

REALITIES AND  
CHALLENGES

WHAT PROBLEMS EXIST IN THE COMPREHENSIVE TREATMENT OF  
EDENTULISM USING DENTAL IMPLANTS?

COMPLICATIONS WITH  
EDENTULOUS IMPLANT  
PROSTHESIS (ISFP)

FRAMEWORK FRACTURE

ABUTMENT SCREW FRACTURE

ABUTMENT SCREW LOOSENING

PROSTHETIC SCREW FRACTURE

PROSTHETIC SCREW LOOSENING

MATERIAL WEAR

VENEER FRACTURE

BOZNE T, PETRIDIS H, GAREFIS K, GAREFIS P. A META-ANALYSIS OF PROSTHOdontIC COMPLICATION RATES OF  
IMPLANT-SUPPORTED FIXED DENTAL PROSTHESES IN EDENTULOUS PATIENTS AFTER AN OBSERVATION PERIOD OF AT LEAST 5 YEARS.  
INT J ORAL MAXILLOFAC IMPLANTS. 2018 MAR-APR;26(2):304-18.

REALITIES AND  
CHALLENGES

IF YOU DON'T KNOW WHERE YOU ARE GOING,  
ANY ROAD WILL TAKE YOU THERE

LEWIS CARROLL

REALITIES AND CHALLENGES



REALITIES AND CHALLENGES

IF YOU DON'T KNOW WHERE YOU ARE GOING,  
YOU'LL END UP SOMEPLACE ELSE

YOSI BERRA

COMPLICATIONS WITH ISFP

**281** ONE PIECE ISFP  
MEAN EXPOSURE TIME=**9.5** YEARS  
**653** COMPLICATION EVENTS  
COMPLICATION RATE: **24.6%/100** RESTORATION YEARS  
RATE OF "PROSTHESIS FREE OF COMPLICATIONS": **29.3%** (AT 5 YEARS)  
**8.6%** (AT 10 YEARS)  
PERI-IMPLANT BONE LOSS: **20.1%** (AT 5 YEARS)  
**40.3%** (AT 10 YEARS)  
SCREW FRACTURE: **10.4%** (AT 5 YEARS)  
**20.8%** (AT 10 YEARS)  
PERI-ABUTMENT TISSUE HYPERPLASIA: **13.0%** (AT 5 YEARS)  
**26.0%** (AT 10 YEARS)  
CHIPPING OR FRACTURE OF VENEERING MATERIAL: **33.3%** (AT 5 YEARS)  
**66.6%** (AT 10 YEARS)

PARASPYRIDAKOS P, CHEN CJ, CHUANG SK, WEBER HP, GALLUCCI GO. A SYSTEMIC REVIEW OF BIOLOGIC AND TECHNICAL COMPLICATIONS WITH FIXED IMPLANT REHABILITATIONS FOR EDENTULOUS PATIENTS. INT J ORAL MAXILLOFAC IMPLANTS 2012 JAN-FEB;27(1):102-10.

COMPLICATIONS WITH  
ISFP

5 YEAR SURVIVAL IS **91.9%** (AVE) FOR PROSTHESES WITH CANTILEVERS  
IMPLANT FRACTURE MAIN CAUSE OF FAILURE

5 YEAR SURVIVAL IS **95.8%** (AVE) FOR PROSTHESES WITHOUT CANTILEVERS

COMPLICATIONS: **20.3%** WITH CANTILEVERS; **9.7%** WITHOUT CANTILEVERS

NO DIFFERENCE WITH PERI-IMPLANT BONE LEVELS BETWEEN THE TWO  
GROUPS

ZURDO J, ROMAO C, WENNSTROM JL. SURVIVAL AND COMPLICATION RATES OF IMPLANT-SUPPORTED FIXED PARTIAL DENTURES WITH CANTILEVERS: A SYSTEMIC REVIEW. CLIN ORAL IMPLANTS RES. 2009 SEP 20; SUPPL 45:59-66.

ISFP OUTCOMES

PROSTHESES MADE UTILIZING STANDARD 5 VISIT PROTOCOL

AVE. OF 10 UNITS (TEETH)

POSTERIOR CANTILEVERS OF 7-10MM

**5 YEAR PROSTHETIC SURVIVAL WAS 100% FOR THE CONTEMPORARY GROUP**

CLINICAL PROBLEMS: DICATION , FRACTURES, IMPLANT FAILURES,  
LOOSE SCREWS, MUCOSAL INFLAMMATION, PROSTHESIS ISSUES,  
TMD PROBLEMS

JEMT T, STENPORT V. EDENTULOUS MAXILLA PART 2: PROSTHETIC TECHNIQUE AND CLINICAL MAINTENANCE IN TWO PATIENT COHORTS RESTORED BETWEEN 1986 AND 1987 AND 15 YEARS LATER. INT J PROSTHODONT 2012;24:356-362.

ISFP TAKE HOME  
MESSAGE

ISFD TREATMENT **IS** SUCCESSFUL

EVEN FOR THE MOST METICULOUS CLINICIAN/TEAM:

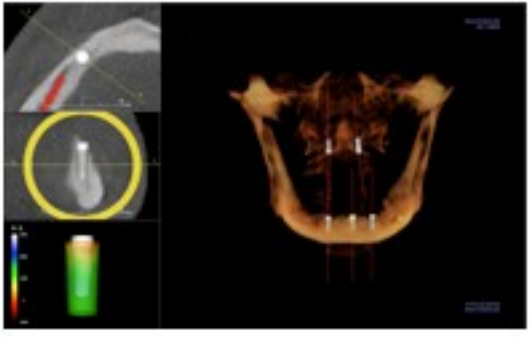
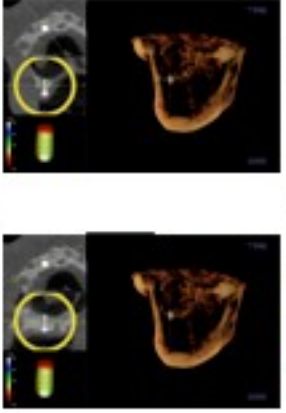
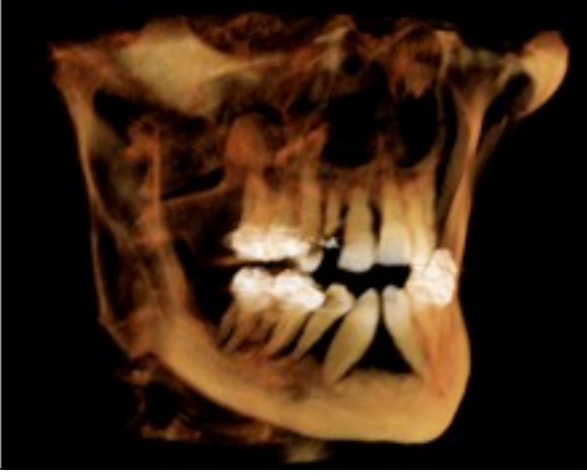
-**15-30%** COMPLICATIONS RATE FOR ISFC TREATMENTS UTILIZING  
CURRENT SOLUTIONS

-PROSTHESES EXPERIENCES WEAR, COMPLICATIONS AND FAILURE

ANALOGUE-ALT.

ANALOGUE-ALT.

ANALOGUE-ALT.



ANALOGUE-ALT.



CURRENT LITERATURE

1. IMPLANTS WITH ROUGH SURFACES SHOWED A STATISTICALLY HIGHER SURVIVAL RATE THAN MACHINED IMPLANTS.
2. THE PROSTHETIC DESIGN, VENEERING MATERIAL AND THE NUMBER OF PROSTHESES PER ARCH HAD NO INFLUENCE ON THE SURVIVAL RATE.
3. IMPLANT NUMBER AND DISTRIBUTION DID INFLUENCE PROSTHODONTIC SURVIVAL RATE.

LAMBERT FE, WEBER HP, SUSARLA SM, BELSER UC, GALLUCCI GO. DESCRIPTIVE ANALYSIS OF IMPLANT AND PROSTHODONTIC SURVIVAL RATES WITH FIXED IMPLANT-SUPPORTED REHABILITATIONS IN THE EDENTULOUS MAXILLA. J PERIODONTOL. 2009 AUG;80(8):1220-30.

ANALOGUE-ALT.



ANALOGUE-ALT.

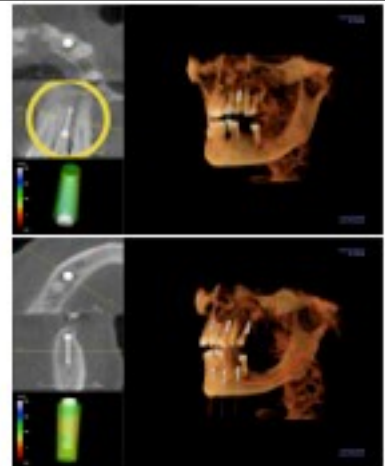
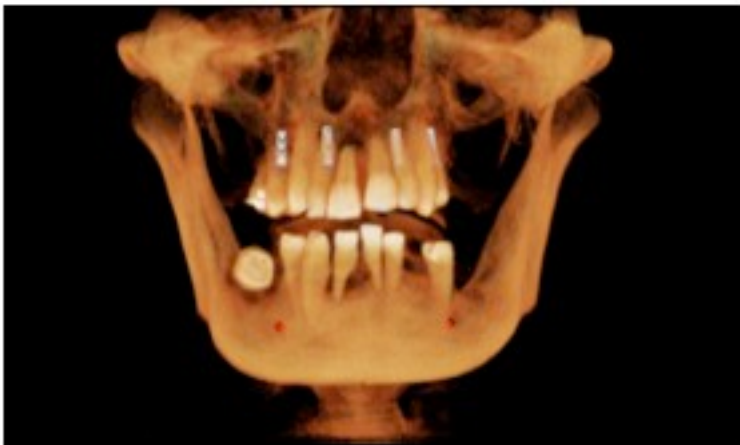


IMPLANT ASSISTED  
TISSUE SUPPORTED

ANALOGUE-ALT.



ANALOGUE-ALT.





ANALOGUE-ALT.

**26% REDUCTION IN SURGICAL TIME WITH THE USE OF CBCT**

BRITISH DENTAL JOURNAL

ANALOGUE-ALT.

**CBCT NOW FULFILLS THE REQUIREMENTS TO BE CONSIDERED A  
STANDARD OF CARE IN THE DIAGNOSIS AND PLANNING OF  
IMPLANT TREATMENT.**

CURLEY A, HATCHER D.  
CONE BEAM CT-ANATOMIC ASSESSMENT AND  
LEGAL ISSUES/THE NEW STANDARDS OF CARE.  
J CALIF DENTAL ASSOC 2009;37:653-662.

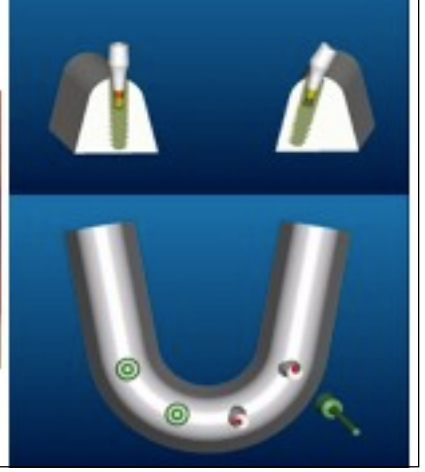
ANALOGUE-ALT.



ANALOGUE-ALT.



ANALOGUE-ALT.



ANALOGUE-ALT.



ANALOGUE-ALT.



**RIGID JIG FACILITATES  
TRANSFER BETWEEN MODELS  
AND MOUTH**

ANALOGUE-ALT.



CURRENT LITERATURE

**SIMILAR CLINICAL OUTCOMES WERE OBTAINED IRRESPECTIVE OF  
WHETHER ACRYLIC RESIN RESTORATIONS WERE REINFORCED WITH  
METAL OR NOT.**

CRESPIN R, VINCI R, CAPPARE P, ROMANOS, GE, GHERLONE. A CLINICAL STUDY OF EDENTULOUS PATIENTS REHABILITATED ACCORDING TO THE 'ALL ON FOUR' IMMEDIATE FUNCTIONAL PROTOCOL. INT J ORAL MAXILLOFAC IMPLANTS. 2012 MAR-APR;27(2):428-34.

ANALOGUE-ALT.



SYSTEM SPECIFIC ABUTMENT  
PROPRIETARY  
TELESCOPIC IMPLANT SUPPORTED REMOVABLE PROSTHESIS

CLASSIC LITERATURE



IMPLANT TREATMENT IN THE EDENTULOUS UPPER JAW FUNCTIONS WELL IN A 15-YEAR TIME PERSPECTIVE. BESIDES WEAR AND FRACTURES OF VENEERS, NO OTHER PARAMETER SHOWED ANY TIME-RELATED RELATIONSHIP. **INCREASING NUMBER OF IMPLANTS AND PATIENTS WITH BONE LEVELS BELOW THE THIRD THREAD, WHICH COULD BE SPECULATED TO INCREASE WITH FUTURE MAINTENANCE AFTER 15 YEARS.**

JEMY T. JOHANSSON J. IMPLANT TREATMENT IN THE EDENTULOUS MAXILLAE: A 15-YEAR FOLLOW-UP STUDY ON 76 CONSECUTIVE PATIENTS PROVIDED WITH FIXED PROSTHESES. CLIN IMPLANT DENT RELAT RES. 2006;8(2):61-9.

ANALOGUE-DIGITAL



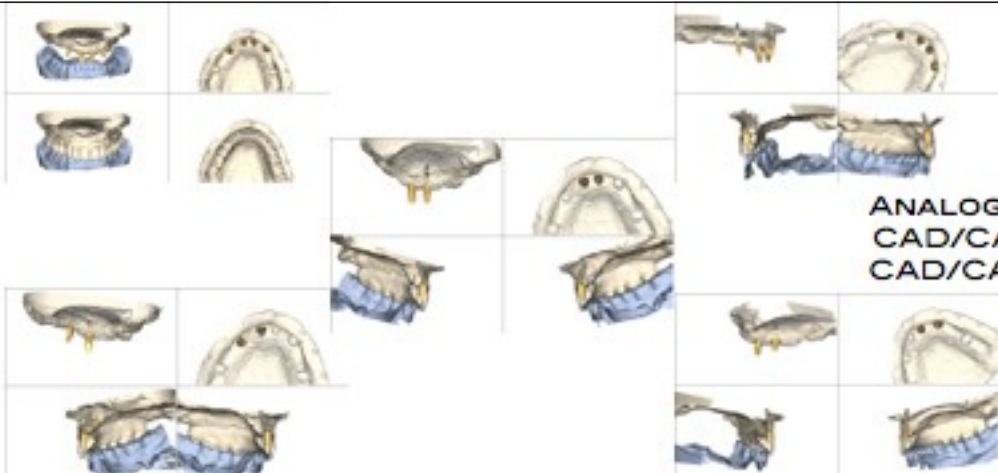
LET'S OPEN OUR EYES AND  
MIND TO THE DIGITAL WORLD

ANALOGUE-DIGITAL

TO CHANGE IS DIFFICULT,  
NOT TO CHANGE IS FATAL

WILLIAM POLLARD

ANALOGUE-DIGITAL



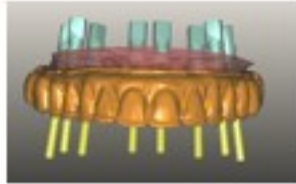
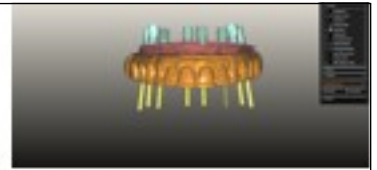
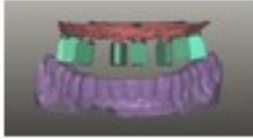
ANALOGUE IMPRESSION  
CAD/CAM ABUTMENTS  
CAD/CAM PROSTHESIS

ANALOGUE-DIGITAL



ANALOGUE IMPRESSION  
CAD/CAM ABUTMENTS  
CAD/CAM PROSTHESIS

ANALOGUE-DIGITAL



ANALOGUE IMPRESSION  
CAD/CAM ABUTMENTS  
CAD/CAM PROSTHESIS



ANALOGUE-DIGITAL



ANALOGUE IMPRESSION  
CAD/CAM ABUTMENTS  
CAD/CAM PROSTHESIS

ANALOGUE-DIGITAL



ANALOGUE IMPRESSION  
CAD/CAM ABUTMENTS  
CAD/CAM PROSTHESIS



PROSTHETIC TISSUE MODELING-INDIVIDUALIZED IMPRESSION TECHNIQUE

1. WHICH IS MOST RELIABLE TECHNIQUE FOR CAPTURING IMPLANT POSITIONING
2. ENSURE PRECISE COMMUNICATION WITH THE DENTAL TECHNICIAN REGARDING THE DESIRED TRANSITION ZONE CONTOURS
3. AVOID UNEXPECTED AND UNWANTED COMPLICATIONS

ADAPTED FROM: HAMMERLE C, JUNG R (2007) PROSTHETIC MANAGEMENT OF IMPLANTS IN THE ESTHETIC ZONE: GENERAL PRINCIPLES AND SCIENTIFIC DOCUMENTATION. IN: BUSER D, BELSER U, WISMEIJER D: ITI TREATMENT GUIDE. VOL 1: IMPLANT THERAPY IN THE ESTHETIC ZONE. QUINTESSENCE PUBLISHING, BERLIN.

CONTEMPORARY DESIGN CONSIDERATION FOR MULTIPLE NON-PARALLEL IMPLANTS



CONTEMPORARY DESIGN CONSIDERATION FOR MULTIPLE NON-PARALLEL IMPLANTS



DIGITAL TREATMENT PLANNING

ANALOGUE-DIGITAL

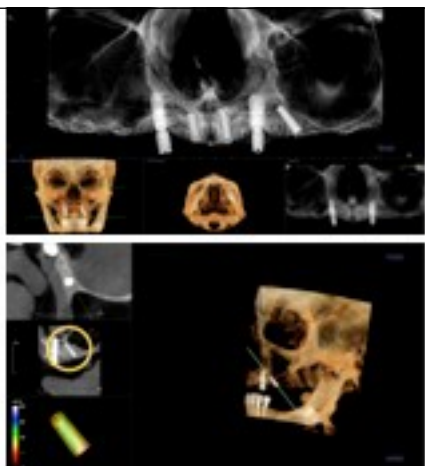


CONTEMPORARY DESIGN CONSIDERATION FOR MULTIPLE NON-PARALLEL IMPLANTS

DIGITAL TREATMENT PLANNING

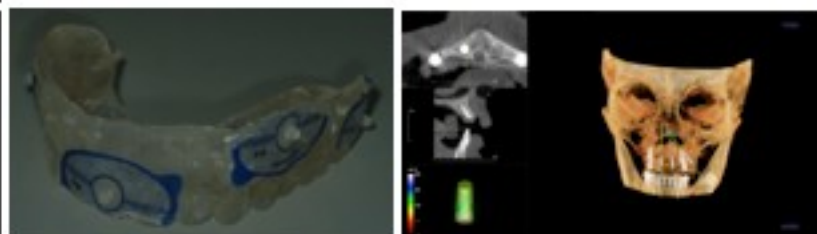
GANZ S. SUMMIT BY THE SEA 2010. NAPLES FLA

ANALOGUE-DIGITAL



CONTEMPORARY DESIGN CONSIDERATION FOR MULTIPLE NON-PARALLEL IMPLANTS

DIGITAL TREATMENT PLANNING



ANALOGUE-DIGITAL



CONTEMPORARY DESIGN CONSIDERATION FOR MULTIPLE NON-PARALLEL IMPLANTS

DIGITALLY GUIDED SURGERY



**TREATMENT OF THE POSTERIOR ATROPHIC MAXILLA WITH GUIDED SURGERY AND TILTED AND STRAIGHT IMPLANTS IS EFFECTIVE.**

POZZI A, SANNINO G, BARLATTANI A. MINIMALLY INVASIVE TREATMENT OF THE ATROPHIC POSTERIOR MAXILLA: A PROOF-OF-CONCEPT PROSPECTIVE STUDY WITH A FOLLOW-UP OF BETWEEN 36 AND 54 MONTHS. *J PROSTHET DENT*. 2012 NOV;108(5):286-97.

**LONG-TERM FOLLOW-UP (MEAN=10YEARS) DEMONSTRATES THAT PATIENTS WITH A SEVERELY RESORBED MAXILLA CAN BE TREATED SUCCESSFULLY WITH CONVENTIONAL IMPLANT TREATMENT. A SIMPLIFIED TECHNIQUE [WITH TILTED IMPLANTS] CAN BE AN ALTERNATIVE.**

ROSEN A, GYNTHNER G. IMPLANT TREATMENT WITHOUT BONE GRAFTING IN EDENTULOUS SEVERELY RESORBED MAXILLAS: A LONG-TERM FOLLOW-UP STUDY. *J ORAL MAXILLOFAC SURG*. 2007 MAY 65(5):1010-6.

**USE OF TILTED IMPLANTS IS AN EFFECTIVE AND SAFE ALTERNATIVE TO MAXILLARY SINUS FLOOR AUGMENTATION PROCEDURES.**

APARICIO C, PERALES P, RANGERT B. TILTED IMPLANTS AS AN ALTERNATIVE TO MAXILLARY SINUS GRAFTING: A CLINICAL, RADIOLOGIC, AND PERI-TEST STUDY. *CUN IMPLANT DENT RELAT RES*. 2001;3(1):39-49.

**THERE WAS NO EVIDENCE OF DIFFERENCES IN SUCCESS RATE BETWEEN TILTED AND AXIAL IMPLANTS...IN STUDIES REVIEWED. IT CAN BE DEDUCED THAT TILTED IMPLANTS EXHIBIT THE SAME BEHAVIOUR AS AXIAL IMPLANTS.**

ATA-ALI J, PENARRROCHA-OLTRA D, CANDEL-MARTI E, PENARRROCHA-DIAGO M. ORAL REHABILITATION WITH TILTED DENTAL IMPLANTS: A METANALYSIS. *MED ORAL PETOL ORAL DIR BUCCAL*. 2012 JUL 17(4):3582-7.

**THE LITERATURE ON TILTED IMPLANTS SHOWS THAT IMPLANTS PLACED WITH THIS TECHNIQUE, HAVE HIGH SUCCESS RATES, MINIMAL COMPLICATIONS AND HIGH PATIENT SATISFACTION.**

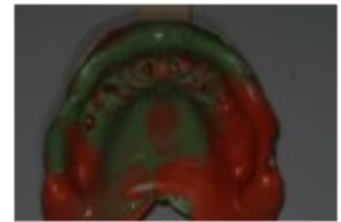
PENARRROCHA-OLTRA D, CANDEL-MARTI E, ATA-ALI J, PENARRROCHA-DIAGO M. REHABILITATION OF THE ATROPHIC MAXILLA WITH TILED IMPLANTS: REVIEW OF THE LITERATURE. *J ORAL IMPLANTOL*. 2013 OCT;39(5):625-32.

ANALOGUE-DIGITAL



CONTEMPORARY DESIGN CONSIDERATION FOR MULTIPLE NON-PARALLEL IMPLANTS

IMPLANT LEVEL IMPRESSION



ANALOGUE-DIGITAL



CONTEMPORARY DESIGN CONSIDERATION FOR MULTIPLE NON-PARALLEL IMPLANTS

OCCLUSAL REGISTRATION-IMPLANT LEVEL



CURRENT LITERATURE

EXCEPT FOR REGULAR IMPLANTS PLACED IN NONAUGMENTED NATIVE BONE, THE PUBLISHED DATA PROVIDE INSUFFICIENT EVIDENCE ABOUT THE OUTCOME OF OTHER PROCEDURES. UNTIL LONG-TERM DATA ARE AVAILABLE SUCH PROCEDURES SHOULD NOT BE CONSIDERED RELIABLE TREATMENT MODALITIES.

ATT W, BERNHART J, STRUB JR. FIXED REHABILITATION OF THE EDENTULOUS MAXILLA: POSSIBILITIES AND CLINICAL OUTCOME. J ORAL MAXILLOFAC SURG. 2009 NOV;76(3 SUPPL):60-73.

ANALOGUE-DIGITAL



CONTEMPORARY DESIGN CONSIDERATION FOR MULTIPLE NON-PARALLEL IMPLANTS

SELECTION AND PLACEMENT OF MULTI-UNIT ABUTMENTS



ANALOGUE-DIGITAL

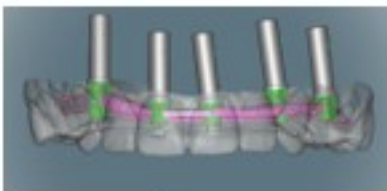


CONTEMPORARY DESIGN CONSIDERATION FOR MULTIPLE NON-PARALLEL IMPLANTS

ABUTMENT LEVEL VERIFICATION

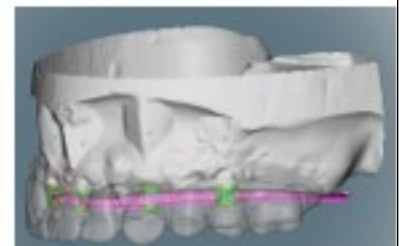


ANALOGUE-DIGITAL



CONTEMPORARY DESIGN CONSIDERATION FOR MULTIPLE NON-PARALLEL IMPLANTS

DIGITAL PROSTHESIS DESIGN



ANALOGUE-DIGITAL

CONTEMPORARY DESIGN CONSIDERATION FOR  
MULTIPLE NON-PARALLEL IMPLANTS



WAX TRY-IN



ANALOGUE-DIGITAL

CONTEMPORARY DESIGN CONSIDERATION FOR  
MULTIPLE NON-PARALLEL IMPLANTS



INSERTION



ANALOGUE-DIGITAL

CONTEMPORARY DESIGN CONSIDERATION FOR  
MULTIPLE NON-PARALLEL IMPLANTS



DIGITAL



DIGITAL WORK FLOW

DENTURE (TRY-IN)	SCANNING	TRY-IN
IMPLANT LEVEL IMPRESSION	DATA CONSOLIDATION	DELIVERY
DUPLICATE DENTURE	DESIGN	OCCUSAL ADJUSTMENT
INTER-ARCH REGISTRATION	DESIGN VERIFICATION	MAINTENANCE
ABUTMENT LEVEL IMPRESSION	CNC MILLING	
INTER-ARCH REGISTRATION	VENEERING	
VERIFICATION JIG		

CURRENT LITERATURE

**THE PRECISION OF CLINICAL TREATMENT PROVIDED BY THE INTEGRATION OF CAD/CAM AND CBCT ALLOWS DENTISTS TO PLAN FOR IDEAL SURGICAL PLACEMENT AND THE APPROPRIATE THICKNESS OF RESTORATIVE MODALITIES BEFORE PLACING IMPLANTS.**

PATEL N. INTEGRATING THREE-DIMENSIONAL DIGITAL TECHNOLOGIES FOR COMPREHENSIVE IMPLANT DENTISTRY. J AM DENT ASSOC. 2010 JUN;141 SUPPL 2:205-45

**CAD/CAM TECHNOLOGY USING THE THREE-DIMENSIONAL IMAGES ALLOWS FOR FABRICATION OF THE SURGICAL GUIDE AND FINAL PROSTHESIS. THIS IS A SIGNIFICANT ADVANCEMENT IN IMPLANT DENTISTRY AND PROSTHODONTICS.**

BALSHI SF, WOLFINGER GJ, BALSHI TJ. SURGICAL PLANNING AND PROSTHESIS CONSTRUCTION USING COMPUTER TECHNOLOGY AND MEDICAL IMAGING FOR IMMEDIATE LOADING OF IMPLANTS IN THE PTERYGOMAXILLARY REGION. INT J PERIODONTICS RESTORATIVE DENT. 2006 JUN;26(3):239-47.

DIGITAL

CONTEMPORARY DESIGN CONSIDERATION FOR  
MULTIPLE NON-PARALLEL IMPLANTS

DIGITAL

CONTEMPORARY DESIGN CONSIDERATION FOR  
MULTIPLE NON-PARALLEL IMPLANTS

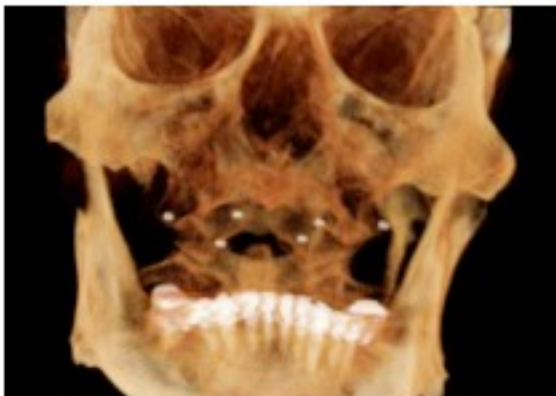


INITIAL PRESENTATION

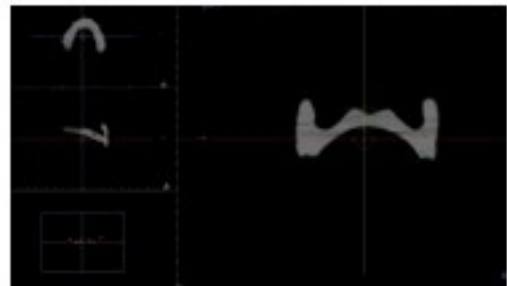


DIGITAL

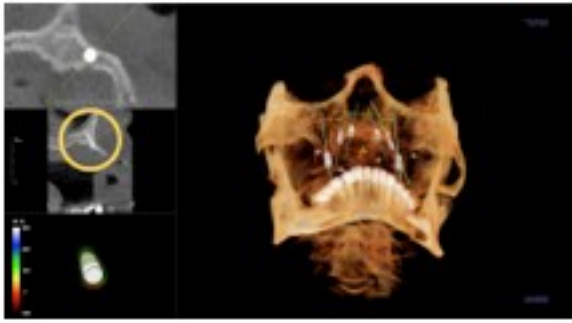
CONTEMPORARY DESIGN CONSIDERATION FOR  
MULTIPLE NON-PARALLEL IMPLANTS



DIGITAL TREATMENT PLANNING



DIGITAL



CONTEMPORARY DESIGN CONSIDERATION FOR  
MULTIPLE NON-PARALLEL IMPLANTS

DIGITAL TREATMENT PLANNING

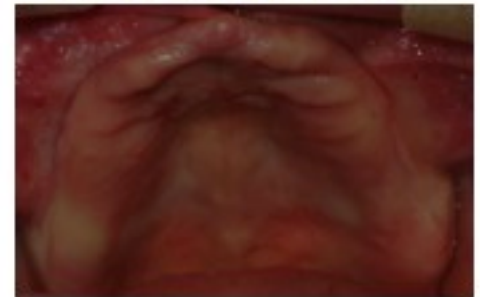


DIGITAL



CONTEMPORARY DESIGN CONSIDERATION FOR  
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SURGICAL PLACEMENT



DIGITAL



CONTEMPORARY DESIGN CONSIDERATION FOR  
MULTIPLE NON-PARALLEL IMPLANTS

IMPRESSION ABUTMENTS-DIGITAL



DIGITAL



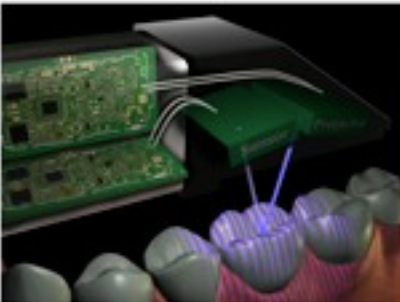
CONTEMPORARY DESIGN CONSIDERATION FOR MULTIPLE NON-PARALLEL IMPLANTS

IMPRESSION ABUTMENTS-DIGITAL

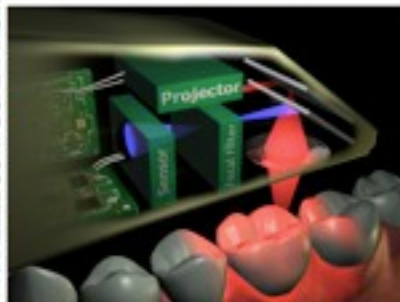


DIGITAL

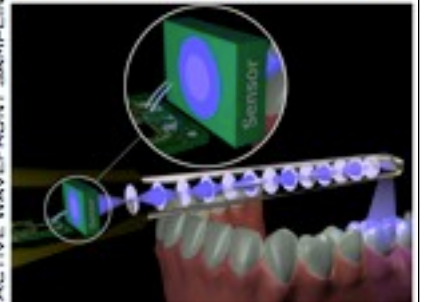
LIGHT STRIPE PROJECTION/TRIANGULATION



PARALLEL CONFOCAL IMAGING



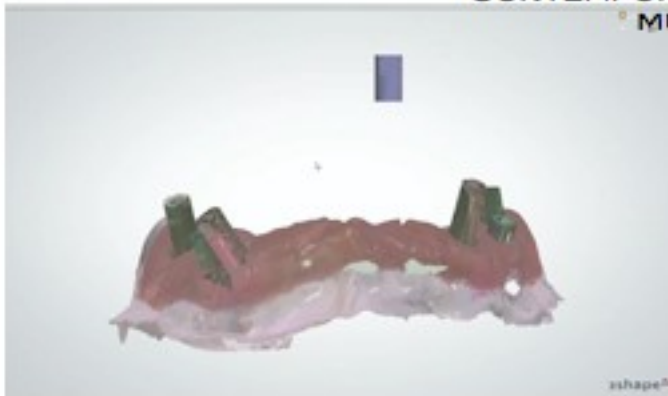
ACTIVE WAVEFRONT SAMPLING



CONTEMPORARY DESIGN CONSIDERATION FOR MULTIPLE NON-PARALLEL IMPLANTS

VARIOUS DIGITAL SCAN SYSTEMS

DIGITAL



CONTEMPORARY DESIGN CONSIDERATION FOR MULTIPLE NON-PARALLEL IMPLANTS

DIGITAL IMPRESSION AND WAX-UP



DIGITAL

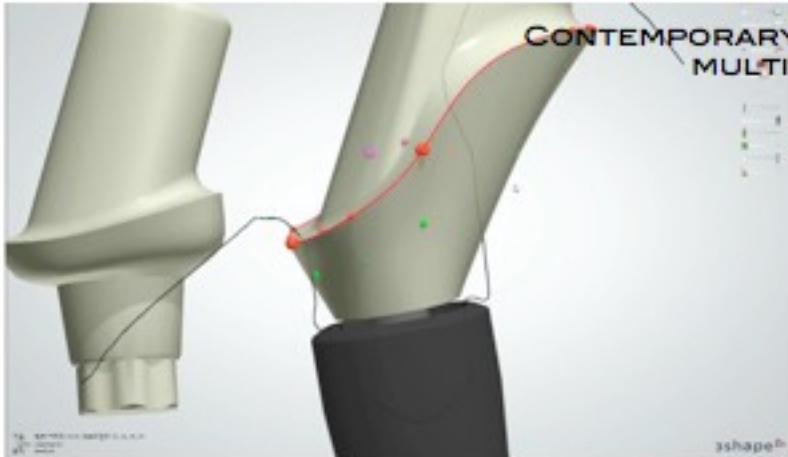


CONTEMPORARY DESIGN CONSIDERATION FOR  
MULTIPLE NON-PARALLEL IMPLANTS

DIGITAL ABUTMENT DESIGN

3shape®

DIGITAL



CONTEMPORARY DESIGN CONSIDERATION FOR  
MULTIPLE NON-PARALLEL IMPLANTS

DIGITAL ABUTMENT DESIGN

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CONTEMPORARY DESIGN CONSIDERATION FOR  
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COMPUTER NUMERICAL CONTROL  
(CNC) MILLING



**THE CUTTING EDGE TECHNOLOGY OF COMPUTER-ASSISTED IMPLANT IMPRESSIONS AND COMPUTER-GENERATED ABUTMENTS WILL LIKELY REPLACE TRADITIONAL IMPLANT RESTORATIVE PROTOCOLS AND BECOME THE STANDARD FOR IMPLANT DENTISTRY IN THE FUTURE.**

PREST G. VIRTUAL-DESIGNED AND COMPUTER-MILLED IMPLANT ABUTMENTS. J ORAL MAXILFAC SURG. 2005 SEP;63(9 SUPPL 2):22-32.

**CAD/CAM ABUTMENTS PRESENT THE ADVANTAGES OF BEING SPECIFIC TO EACH PATIENT AND PROVIDING A BETTER FIT.**

FUSTER-TORRES MA, ALBALAT-ESTELA S, ALCANIZ-IRAYA M, PENARROCHA-DIAGO M. CAD/CAM DENTAL SYSTEMS IN IMPLANT DENTISTRY: UPDATE. MED ORAL PATOL ORAL CIR BUCCAL. 2009 MAR;11(3):E45-65.

**CONTEMPORARY DESIGN CONSIDERATION FOR MULTIPLE NON-PARALLEL IMPLANTS**

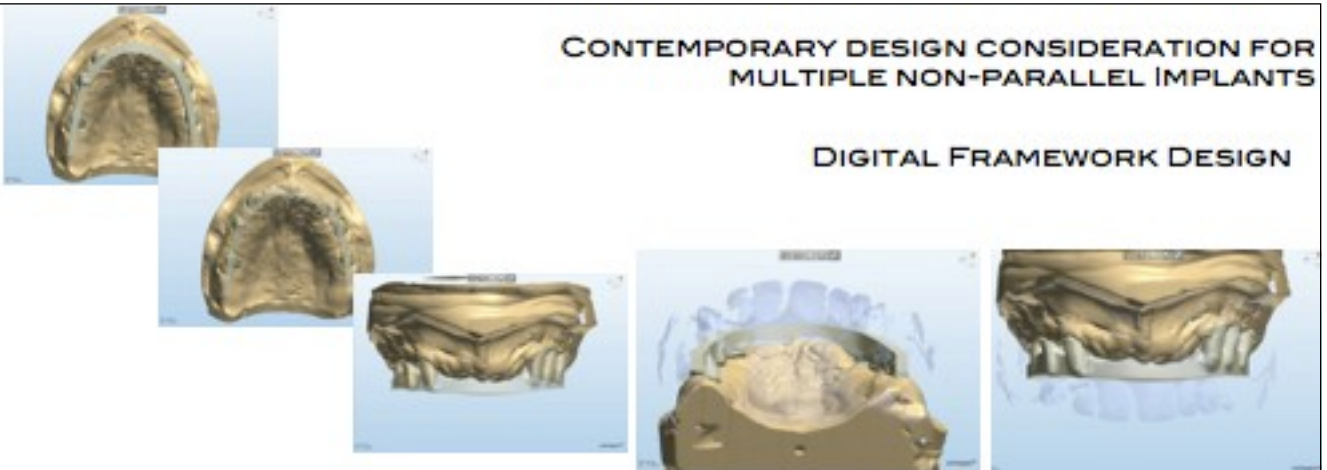


**ABUTMENT TRY-IN**



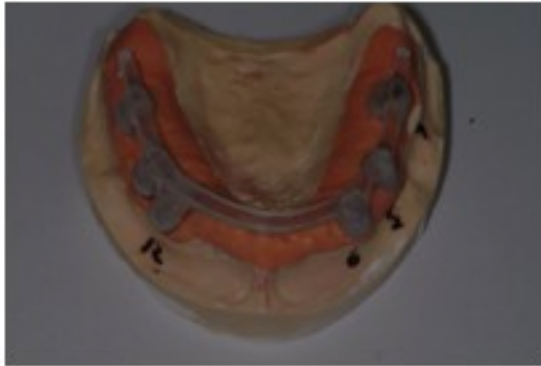
**CONTEMPORARY DESIGN CONSIDERATION FOR MULTIPLE NON-PARALLEL IMPLANTS**

**DIGITAL FRAMEWORK DESIGN**



DIGITAL

CONTEMPORARY DESIGN CONSIDERATION FOR  
MULTIPLE NON-PARALLEL IMPLANTS



DIGITAL FRAMEWORK DESIGN



CURRENT LITERATURE

BASED ON A SYSTEMIC REVIEW OF THE LITERATURE CONCERNING CAD/  
CAM USED FOR FABRICATION OF FRAMEWORKS AND ABUTMENTS, PROOF  
OF CONCEPT WAS ESTABLISHED. **NO** SIGNIFICANT FAILURES OR  
COMPLICATIONS WERE REPORTED IN ASSOCIATION WITH THE IMPLANTS AND  
THEIR RESTORATIONS.

KAPOS T, ASHY LM, GALLUCCI GO, WEBER HP, WISEMEIJER D. COMPUTER-AIDED DESIGN AND COMPUTER-ASSISTED MANUFACTURING IN PROSTHETIC  
IMPLANT DENTISTRY. INT J ORAL MAXILLOFAC IMPLANTS. 2009;24 SUPPL:110-7.

DIGITAL

CONTEMPORARY DESIGN CONSIDERATION FOR  
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DEFINITIVE PROSTHESES  
DELIVERY



CONTEMPORARY DESIGN CONSIDERATION FOR  
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DIGITAL



DEFINITIVE PROSTHESES  
DELIVERY



THREE TYPES OF  
TREATMENT

**GOOD-CHEAP-FAST**

C JANSEN 2013

THREE TYPES OF  
TREATMENT

**GOOD TREATMENT CHEAP IS NOT FAST**

C JANSEN 2013

THREE TYPES OF  
TREATMENT

GOOD TREATMENT CHEAP IS NOT FAST  
FAST TREATMENT CHEAP IS NOT GOOD

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THREE TYPES OF  
TREATMENT

GOOD TREATMENT CHEAP IS NOT FAST  
FAST TREATMENT CHEAP IS NOT GOOD  
GOOD TREATMENT FAST WON'T BE CHEAP

C JANSEN 2013

IMPLANT DENTISTRY

WITH IMPLANT DENTISTRY  
WE ARE NOT SAVING LIVES  
WE ARE CHANGING THEM  
ONE SMILE AT A TIME

IMPLANT DENTISTRY



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