fdi Annual World Dental Congress POZNAŃ 2016
Poznań, Poland
September 7-10, 2016

Academy of Osseointegration

Symposium

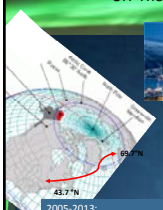
Esthetic outcomes for single implants in the anterior maxilla and dimensions of the peri-implant hard and soft tissues

Dr. Asbjørn Jokstad

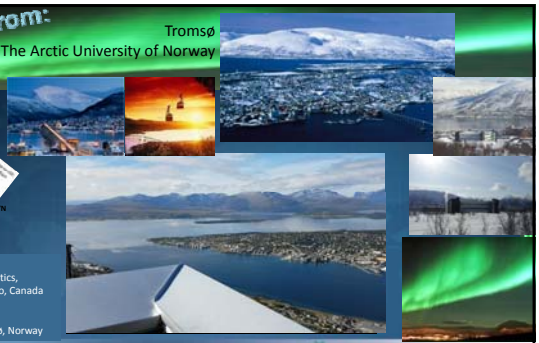
Academy of Osseointegration
2017 ANNUAL MEETING March 15-18 Orlando

Greetings from:

Tromsø
UiT The Arctic University of Norway



2005-2013:
Head of prosthodontics,
University of Toronto, Canada
2013 - current:
Clinical Dentistry,
University of Tromsø, Norway



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Learning objectives of this presentation

1. *Be aware of* evaluation systems to appraise the qualities of the soft tissues in patients having received a single crown
2. *Be familiar with* the effects of various clinical variables on peri-implant soft tissue appearance and cortical bone loss
3. *Be acquainted with* clinical research focused on dimensional relationships between the implant-crown-complex and clinical and radiographical landmarks

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1. Evaluation of esthetic outcomes

A satisfactory esthetic outcome?

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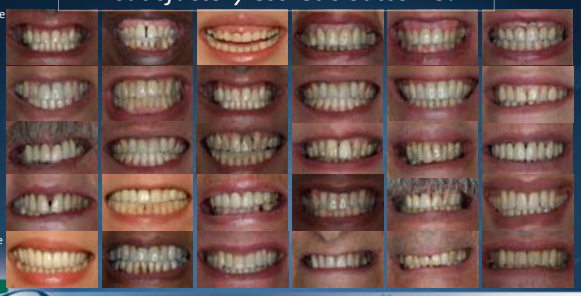
A satisfactory esthetic outcome?

High smile line A.K.A. "Gummy smile"

Low smile line



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A satisfactory esthetic outcome?

Fava et al. COIR 2015

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2. Evaluation of esthetic outcomes in implant dentistry

Established evaluation system

1971 USPHS / Ryge criteria - " US Public Health Service" (Cvar & Ryge)

1977 CDA criteria – "California Dental Association"

Categorical levels:
Alfa – Bravo – Charlie - Delta
Romeo – Sierra – Michigan -Tango – Victor

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2. Evaluation of esthetic outcomes in implant dentistry

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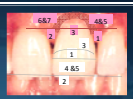
Specifically to implant-retained reconstructions in the esthetic zones
2005 ICAI - "Implant Crown Aesthetic Index" (Meijer et al. COIR)



1&2 Position of mucosa in the approximal embrasures: must be in their natural position, 3-points (deviation >1.5 mm- <1.5 mm- no deviation)

3 Position of the labial margin of the peri-implant mucosa: must be at the same level as the contralateral tooth and in harmony with the adjacent teeth, 3-points (deviation ≥1.5 mm- <1.5 mm- no deviation)

4&5 Contour of the labial surface of the mucosa: must be in harmony with the adjacent and contralateral tooth, **5-points** (gross - slight undercontoured - no deviation - slight - gross overcontoured)

6&7 Colour and surface of the labial mucosa: must be in harmony with the adjacent and contralateral tooth and must have a natural appearance, 3-points (gross - slight - no mismatch)

1. Mesiodistal dimension of the crown: must be in harmony with the adjacent and contralateral tooth, **5-points (**gross - slight undercontour- no deviation - slight - gross overcontour)
2. Position of the incisal edge of the crown: must be in harmony with the adjacent and contralateral tooth, **5-points** (gross - slight undercontour- no deviation - slight - gross overcontour)
3. Labial convexity of the crown: must be in harmony with the adjacent and contralateral tooth, **5-points** (gross - slight undercontour- no deviation - slight - gross overcontour)
4. Colour and translucency of the crown: must be in harmony with the adjacent and contralateral tooth, 3-points (gross -slight -no mismatch)
5. Surface of the crown: characteristics of the crown such as roughness and ridges must be in harmony with the adjacent and contralateral tooth, 3-points (gross -slight -no mismatch)

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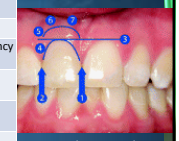
Variable		0	1	2
Mesial papilla	Shape vs. reference tooth	Absent	Incomplete	Complete
Distal papilla	Shape vs. reference tooth	Absent	Incomplete	Complete
Level of soft-tissue margin	Level vs. reference tooth	Major discrepancy >2 mm	Minor discrepancy 1–2 mm	No discrepancy <1 mm
Soft-tissue contour	Natural, matching reference tooth	Unnatural	Fairly natural	Natural
Alveolar process	Alveolar process deficiency	Obvious	Slight	None
Soft-tissue color	Color vs. reference tooth	Obvious difference	Moderate difference	No difference
Soft-tissue texture	Texture vs. reference tooth	Obvious difference	Moderate difference	No difference



From: Fürhauser et al. 2005

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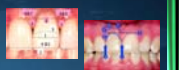
2009 PES/WES - "Pink and white esthetic score" (Belser et al. J.Perio)



From: Belser et al. 2009

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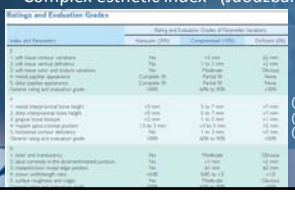

(S): soft tissue index
(P): predictive index ("Bone")
(R): implant-supported restoration index

Measure of degree of perfection vs. reality ?

Criteria for scoring esthetical outcome may at times create a challenge

The single implant-supported crowns "stand out positively", but should per definition be scored "low" because they do not blend in with the remaining teeth and gingiva contours

15-20 yr old implant-crowns
Jokstad et al. IJOMI 2016 (in press)

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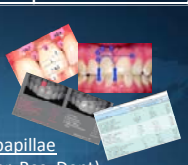
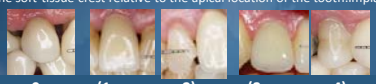


Specifically to implant-retained reconstructions and papillae

1997 PI – "(Jemt) Papilla Index" score (Jemt Int. J. Per. Res. Dent)

i.e., position of the soft-tissue crest relative to the apical location of the tooth:implant-crown contact area



Score: 0 (1 2) (3 4)

-/+ ≥ half the height

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2. Effects of clinical variables on peri-implant soft tissue appearance and cortical bone loss

We may today expect predictable esthetic outcomes due to refinements over the years:

- Alternative surgical and restorative treatment strategies
- Innovative implant system components and biomaterials

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Alternative surgical and restorative treatment strategies

© 2009 International Team for Implantology

Timing of implant placement

Classification	Descriptive Terminology	Period after Tooth Extraction	Desired Clinical Situation at Implant Placement
Type 1	Immediate placement	Immediately following extraction	Post-extraction site with no healing of bone or soft tissues
Type 2	Early placement with soft-tissue healing	Typically 4 to 8 weeks	Post-extraction site with healed soft tissue but without significant bone healing
Type 3	Early placement with partial bone healing	Typically 12 to 16 weeks	Post-extraction site with healed soft tissues and with significant bone healing
Type 4	Late placement	Typically 6 months or longer	Fully healed post-extraction site

Loading protocol alternatives

Loading Protocol	Definition
Immediate restoration	A restoration is inserted within 48 hours of implant placement, but not in occlusion with the opposing dentition
Immediate loading	A restoration is placed in occlusion with the opposing dentition within 48 hours of implant placement
Conventional loading	The prosthesis is attached after a healing period of 3 to 6 months
Early loading	A restoration in contact with the opposing dentition is placed at least 48 hours after implant placement but not later than 3 months afterwards
Delayed Loading	The prosthesis is attached in a procedure that takes place some time later than the conventional healing period of 3 to 6 months

+/-
Socket preservation

+/-
Site enhancement
- Bone
- Soft-tissues
- Keratinized gingiva

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Alternative surgical and restorative treatment strategies for healed sites / missing teeth

1. Implant placed +/- augment → Heal +/-4 mths → Load Temp./permanent prosthesis
2. Implant placed +/- augment → Heal +/-4 mths → Recovery surgery for esthetics* → Soft-tissue building → Load Temp./permanent prosthesis
3. Implant placed +/- augment & Load temporary prost
4. Implant placed +/- augme Load temporary prosthe
5. Implant placed +/- augn Load permanent prost

Observation of Load

Clinical Oral Investigations
September 2016, Volume 20, Issue 7, pp 1369–1387

Soft tissue augmentation procedures at second-stage surgery: a systematic review

Renzo G. Bassetti, Alexandra Stähli, Mario A. Bassetti, Anton Sculean

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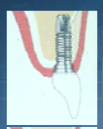
90ies advices for placement (in a healed site)

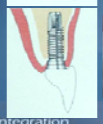
Place as vertically as possible (avoid non-axial loading!)

+ buccal grafting

OR

place palatinally to make "ridge-lap crown"





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90ies advices for placement (in a healed site)

Place as vertically as possible (avoid non-axial loading!)

+ buccal grafting
OR
place palatinally to make "ridge-lap crown"

OR
Place in the centre axis of the remaining alveolar bone → often angulated abutment need

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Alternative surgical and restorative treatment strategies for remaining hopeless tooth / root

1	Remaining tooth extracted +/- augment	Heal +/-3 mths	Implant placed +/- augment	Heal +/- 4 mths	Load Temp./perm. prosthesis	
2	Remaining tooth extracted +/- augment	Heal +/-3 mths	Implant placed +/- augment	Heal +/- 4 mths	Recovery surgery for esthetics	Soft-tissue building	Load Temp./perm. prosthesis
3	Remaining tooth extracted +/- augment	Heal +/- 3 mths	Implant placed +/- augment & Load Temp./perm. prosthesis			

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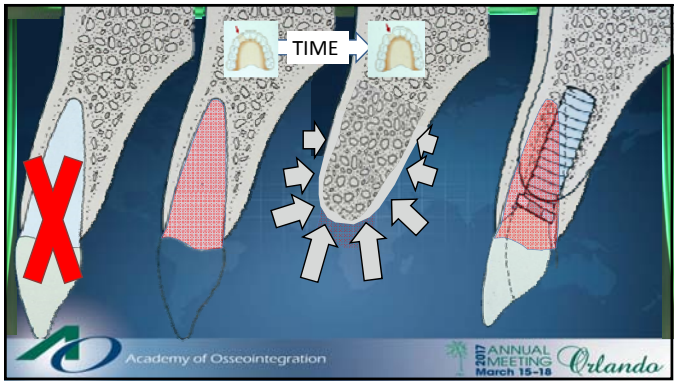

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3	Remaining tooth extracted +/- augment	Heal +/- 3 mths	Implant placed +/- augment & Load Temp./perm. prosthesis				
4	Remaining tooth extracted & Implant placed +/- augment	Heal +/- 4 mths	Load Temp./perm. prosthesis				
5	Remaining tooth extracted & Implant placed +/- augment	Heal +/- 4 mths	Recovery surgery for esthetics*	Soft-tissue building	Load Temp./perm. prosthesis		
6	Remaining tooth extracted & Implant placed +/- augment & Load temporary prosthesis	Observation of esthetic outcome	Load Perm. prosthesis				
7	Remaining tooth extracted & Implant placed +/- augment & Load temporary prosthesis	Observation of esthetic outcome	Recovery surgery for esthetics	Soft-tissue building	Load Perm. prosthesis		
8	**Remaining tooth extracted & Implant placed +/- augment & Load permanent prosthesis**						

2. Effects of clinical variables on peri-implant soft tissue appearance and cortical bone loss

We may today expect predictable esthetic outcomes due to refinements over the years:

- Alternative surgical and restorative treatment strategies
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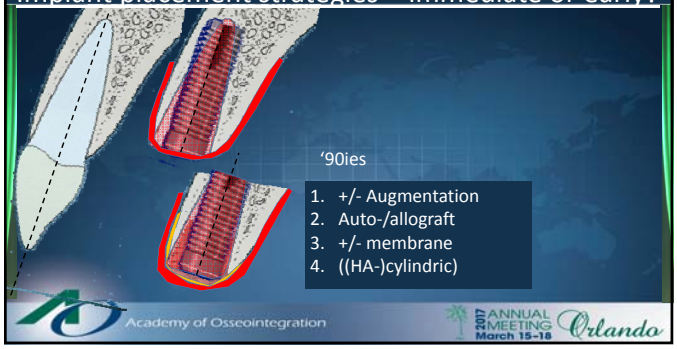
Implant placement strategies – immediate or early?



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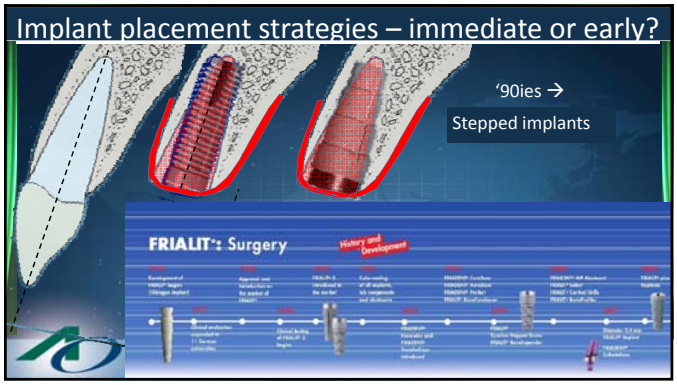
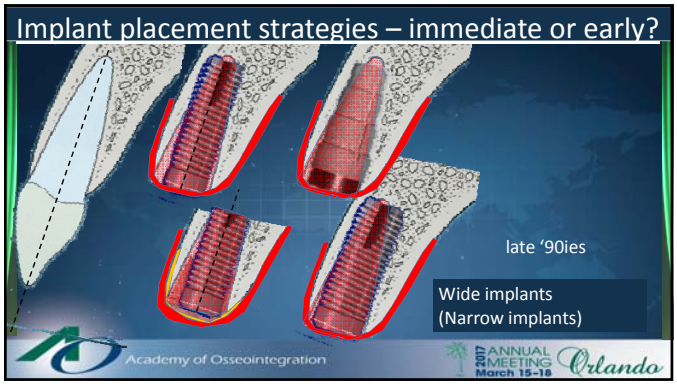
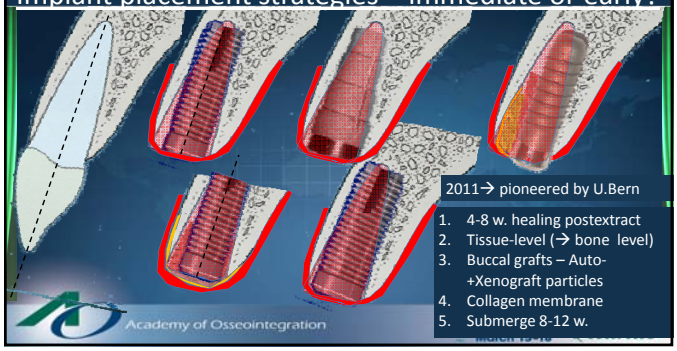


Implant placement strategies – immediate or early?



Implant placement strategies – immediate or early?



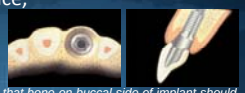
2011→ pioneered by U.Bern

1. 4-8 w. healing postextract
2. Tissue-level (→ bone level)
3. Buccal grafts – Auto- +Xenograft particles
4. Collagen membrane
5. Submerge 8-12 w.

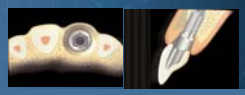
A deductive reasoning approach

Premise: A 1.5 mm wide "circumferential crater" exists around all implants, including on the buccal side. Hence,

1. ... the bone thickness should be at least 2 mm, preferably 4 mm
2. If < 2mm bone is available, part of the buccal bone plate will be lost after remodeling, with the consequence of a high risk of soft tissue recession
3. Such a large amount of bone buccally does not exist normally, and has to be created with augmentation procedures in almost every esthetically demanding case



Thickness that bone on buccal side of implant should have to support gingival margin despite horizontal crater formation.

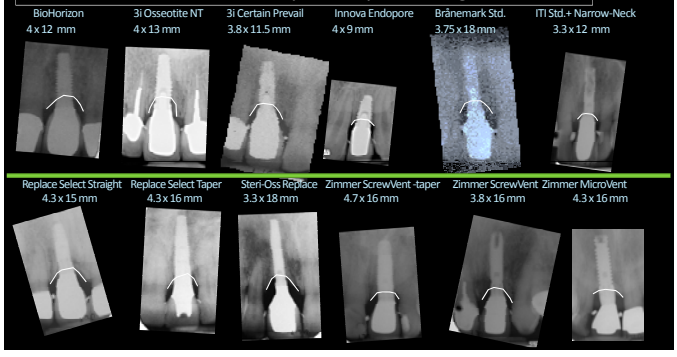


Amount of bone needed to accommodate circumferential crater without loss of height in buccal mucosal margin; dotted line = original degree of B-L resorption

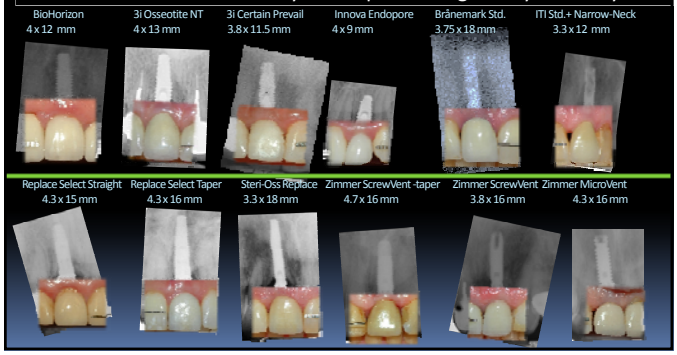
From: Grunder et al. IJPRD 2005

Influential paper
BUT
The evidence of the premise is weak
see: Zhang et al. COIR 2014

"Saucerization" – influence by the implant design?



"Saucerization" – influence by the implant design or by anatomy?



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The parameters to achieve the best possible appearance of peri-implant soft-tissues?

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Potential effect of site or surgery variables on outcome?

1. Tissue biotype / thickness
2. Incision / flap design
3. Osteotomy procedure
4. Implant position, vertical & adjacent tissues
5. Torque / primary stability
6. Flap handling
7. Suturing technique
8. Cover screw / tenting abutment

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Potential effect of site or surgery variables on outcome?

1. Tissue biotype / thickness – thin vs thick

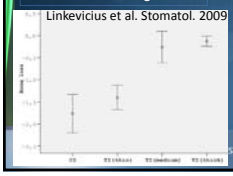
Thin biotype gingiva is more prone to recession

Kan et al. IJOMI 2011

Mucosa thickness over implant may influence crestal bone changes

Lops et al. J.Esth.D 2015

Linkevicius et al. Stomatol. 2009



da Rosa et al. IJPRD 2014

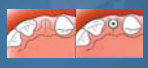
Cardarolopi et al. IJPRD 2015

Zuiderveld et al. 2014

Potential effect of site or surgery variables on outcome?

1. Tissue biotype / thickness – thin vs thick
2. Incision / flap design - use
   1. Trapezoidal instead of intra-sulcular incision (Gomez-Roman IJOMI 2001)

   2. Split-finger approach (Misch et al. Imp Dent 2004)



Potential effect of site or surgery variables on outcome?

1. Tissue biotype / thickness – thin vs thick
2. Incision / flap design - **papilla-sparing approach**
3. Osteotomy procedure — Evidence is inconclusive
4. Implant position, vertical & adjacent tissues
5. Torque / primary stability — Evidence is conflicting
6. Flap handling — Evidence is inconclusive
7. Suturing technique — Evidence is inconclusive
8. Cover screw / "tenting" abutment — Evidence is lacking

Keratinized gingiva - Wennström & Derks COIR 2012 — Evidence is lacking

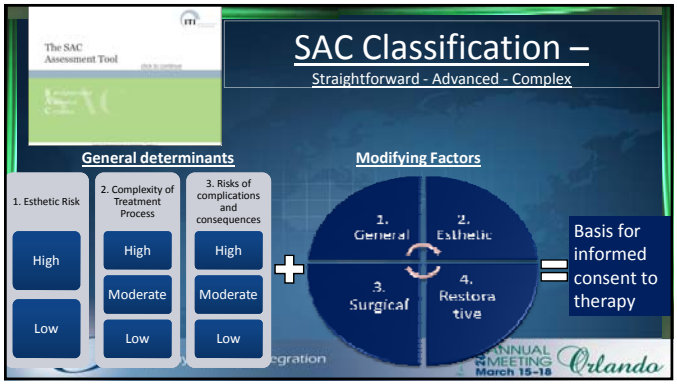
Crown-implant ratio - Gulje et al. IJOMI 2015 — Not likely

"Platform-switching" — Evidence is conflicting

Abutment connect-disconnect — Evidence is lacking

If also immediate placement:
- Extraction reason
- Extraction technique
- Socket debridement
- Socket preservation

Evidence is inconclusive, or conflicting or lacking


The SAC Assessment Tool
SAC Classification –
Straightforward - Advanced - Complex
General determinants
Modifying Factors
1. Esthetic Risk
2. Complexity of Treatment Process
3. Risks of complications and consequences
High
Moderate
Low
1. General
2. Esthetic
3. Surgical
4. Restorative
Basis for informed consent to therapy
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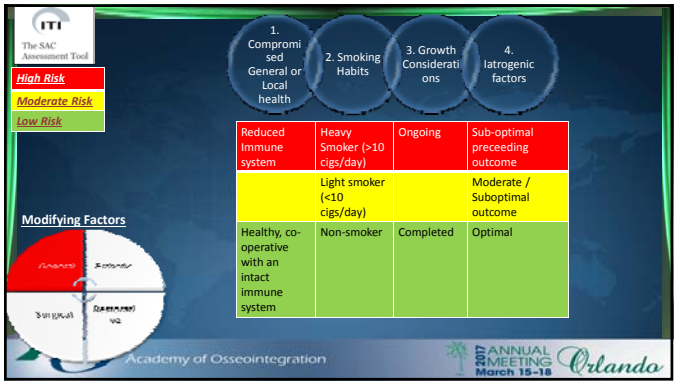
The SAC Assessment Tool
High Risk
Moderate Risk
Low Risk
1. Compromised General or Local health
2. Smoking Habits
3. Growth Considerations
4. Iatrogenic factors
Reduced Immune system
Heavy Smoker (>10 cigs/day)
Ongoing
Sub-optimal preceeding outcome
Light smoker (<10 cigs/day)
Moderate / Suboptimal outcome
Healthy, co-operative with an intact immune system
Non-smoker
Completed
Optimal
Modifying Factors
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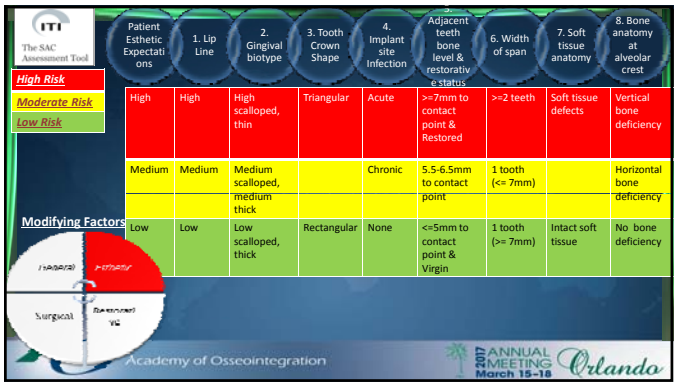
The SAC Assessment Tool
High Risk
Moderate Risk
Low Risk
Patient Esthetic Expectations
1. Lip Line
2. Gingival biotype
3. Tooth Crown Shape
4. Implant site Infection
Adjacent teeth bone level & restorative status
6. Width of span
7. Soft tissue anatomy
8. Bone anatomy at alveolar crest
High
High
High scalloped, thin
Triangular
Acute
>=7mm to contact point & Restored
>=2 teeth
Soft tissue defects
Vertical bone deficiency
Medium
Medium
Medium scalloped, medium thick
Chronic
5.5-6.5mm to contact point
1 tooth (<= 7mm)
Horizontal bone deficiency
Low
Low
Low scalloped, thick
Rectangular
None
<=5mm to contact point & Virgin
1 tooth (>= 7mm)
Intact soft tissue
No bone deficiency
Modifying Factors
Surgical
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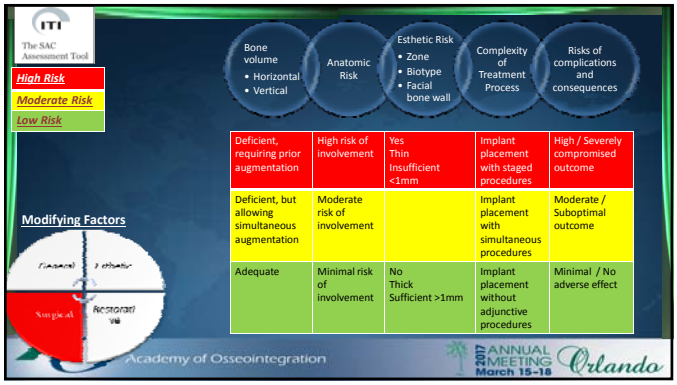
The SAC Assessment Tool
High Risk
Moderate Risk
Low Risk
Bone volume
• Horizontal
• Vertical
Anatomic Risk
Esthetic Risk
• Zone
• Biotype
• Facial bone wall
Complexity of Treatment Process
Risks of complications and consequences
Deficient, requiring prior augmentation
High risk of involvement
Yes
Thin
Insufficient <1mm
Implant placement with staged procedures
High / Severely compromised outcome
Deficient, but allowing simultaneous augmentation
Moderate risk of involvement
Implant placement with simultaneous procedures
Moderate / Suboptimal outcome
Adequate
Minimal risk of involvement
No
Thick
Sufficient >1mm
Implant placement without adjunctive procedures
Minimal / No adverse effect
Modifying Factors
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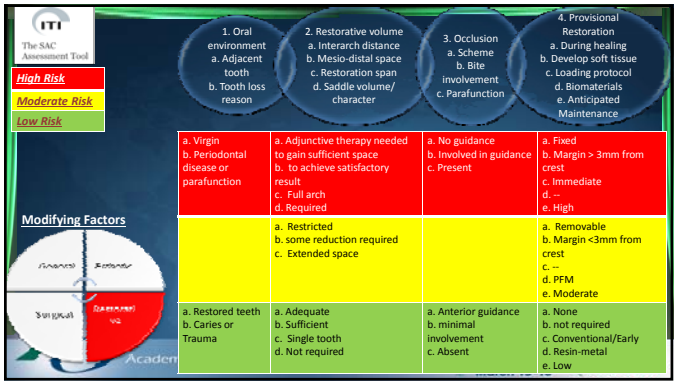
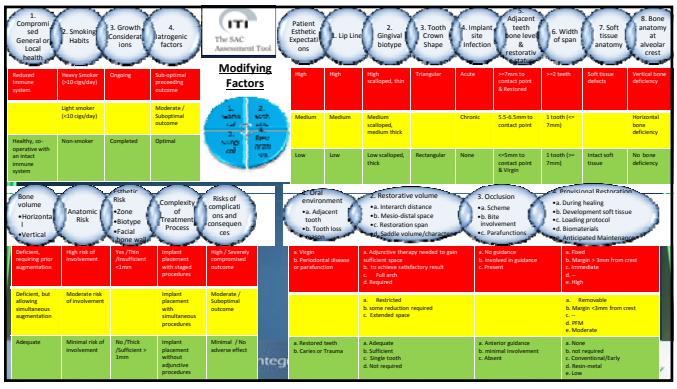
March 15-18
Orlando


The SAC Assessment Tool
High Risk
Moderate Risk
Low Risk
1. Oral environment
a. Adjacent tooth
b. Tooth loss reason
2. Restorative volume
a. Interarch distance
b. Mesio-distal space
c. Restoration span
d. Saddle volume/ character
3. Occlusion
a. Scheme
b. Bite involvement
c. Parafunction
4. Provisional Restoration
a. During healing
b. Develop soft tissue
c. Loading protocol
d. Biomaterials
e. Anticipated Maintenance
a. Virgin
b. Periodontal disease or parafunction
a. Adjunctive therapy needed to gain sufficient space
b. to achieve satisfactory result
c. Full arch
d. Required
a. No guidance
b. Involved in guidance
c. Present
a. Fixed
b. Margin > 3mm from crest
c. Immediate
d. --
e. High
a. Restricted
b. some reduction required
c. Extended space
a. Removable
b. Margin <3mm from crest
c. --
d. PFM
e. Moderate
a. Restored teeth
b. Caries or Trauma
a. Adequate
b. Sufficient
c. Single tooth
d. Not required
a. Anterior guidance
b. minimal involvement
c. Absent
a. None
b. not required
c. Conventional/Early
d. Resin-metal
e. Low
Modifying Factors



Learning objectives of this presentation

1. *Be aware of* evaluation systems to appraise the qualities of the soft tissues in patients having received a single crown
2. *Be familiar with* the effects of various clinical variables on peri-implant soft tissue appearance and coronal bone loss
3. *Be acquainted with* clinical research focused on dimensional relationships between the implant-crown-complex and clinical and radiographical landmarks

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Studying esthetic outcome and anatomic dimensions

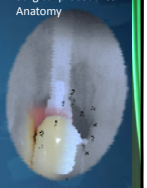
Observation studies (i.e., measured at a single point of time)

Bone level
- Buccally — Clinic — Radiographic
- Proximally — Clinic — Radiographic

Soft tissue:
- Appearance — Clinic — Photographic
- Level — Clinic — Photographic/models
- Buccally - Proximally

Bone and soft tissue levels and appearance may be **associated** with different variables

Clinical variables, e.g.,
Implant hardware
Surgical procedures
Anatomy



Outcome measure (i.e. measured as a change from baseline)

Bone level
- Buccally — Clinic — Radiographic
- Proximally — Clinic — Radiographic

Soft tissue:
- Appearance — Clinic — Photographic
- Level — Clinic — Photographic/models
- Buccally - Proximally

Different variables may **cause** or influence bone and soft tissue levels and appearance changes

Simplistic versus complex (multivariate) statistics
1. Generalized estimating equations (GEE)
2. General linear modelling (GLM)
3. Multilevel analyses (AKA mixed / hierarchical / random effects models

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Studying esthetic outcome and anatomic dimensions

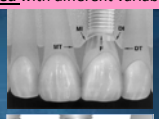
Observation (i.e., single point of time)

Bone level
- **Buccally** — **Clinic** — Radiographic
- **Proximally** — **Clinic** — Radiographic

Soft tissue:
- **Appearance** — **Clinic** — Photographic
- **Level** — **Clinic** — Photographic/models
- **Buccally** - **Proximally**

Bone and soft tissue levels and appearance may be **associated** with different variables

Kan et al.
J Perio 2003
n=45 pat.
Bivariate statistics
Association?: YES



Gastaldo et al.
J Perio 2004
n=48 pat.
Bivariate statistics
Association?: YES

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Studying esthetic outcome and anatomic dimensions

Observation (i.e., single point of time)

Bone level

Buccally	Clinic	Radiographic
Proximally	Clinic	**Radiographic**

Soft tissue:

Appearance	Clinic	Photographic
Level	Clinic	Photographic/models

Buccally - Proximally

Observation (i.e., single point of time)

Bone level

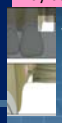
Buccally	Clinic	Radiographic
Proximally	**Clinic**	**Radiographic**

Soft tissue:

Appearance	Clinic	Photographic
Level	Clinic	Photographic/models

Buccally - Proximally

Bone and soft tissue levels and appearance may be **associated** with different variables



Vela et al.
IJPRD 2012
n=50 pat.
Bivariate statistics
Association?: YES

Kourkouta et al.
COIR 2009
n=15 pat.
Bivariate statistics
Association?: YES

Perez et al.
IJPRD 2012
n=46 imp..
Bivariate statistics
Association?: YES

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Observation (i.e., single point of time)

Bone level

Buccally	Clinic	Radiographic
Proximally	**Clinic**	**Radiographic**

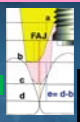
Soft tissue:

Appearance	**Clinic**	**Photographic**
Level	**Clinic**	**Photographic/models**

Buccally - **Proximally**

Bone and soft tissue levels and appearance may be **associated** with different variables

Choquet et al.
J Perio 2001
n=26 pat.
Bivariate statistics
Association?: YES



Kawai & Almeida
Cleft P-C J 2008
n=40 pat.
Bivariate statistics
Association?: YES

Lops & Romeo
COIR 2008
n=46 pat.
Bivariate statistics
Association?: NO

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Observation (i.e., single point of time)

Bone level

Buccally	**Clinic**	**Radiographic**
Proximally	**Clinic**	**Radiographic**

Soft tissue:

Appearance	**Clinic**	**Photographic**
Level	**Clinic**	**Photographic/models**

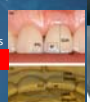
Buccally - Proximally

+ cbCT

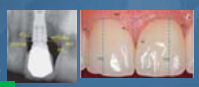
Bone and soft tissue levels and appearance may be **associated** with different variables

Nispakultorn et al.
COIR 2010
n=40 pat.
Bivariate stats
Association?: YES

Chang & Wennstrom
COIR 2013
n=32 pat.
Multivariate stats
Association?: NO



Peng et al.
IJPRD 2013
n=25 pat.
Bivariate stats
Association?: YES



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Outcome measure (i.e. measured as a change from baseline)

Bone level

Buccally	**Clinic**	Radiographic
Proximally	**Clinic**	Radiographic

Soft tissue:

Appearance	**Clinic**	Photographic
Level	**Clinic**	Photographic/models

Buccally - Proximally

Outcome measure (i.e. measured as a change from baseline)

Bone level

Buccally	**Clinic**	Radiographic
Proximally	**Clinic**	**Radiographic**

Soft tissue:

Appearance	**Clinic**	**Photographic**
Level	**Clinic**	**Photographic/models**

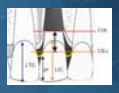
Buccally - Proximally

Different variables may cause or influence bone and soft tissue levels and appearance changes

Grunder
IJPRD 2000
n=10 pat.
No statistics

Association?: YES

Gotfredsen
CIDRR 2004, CIDRR 2009
n=20 pat.
Bivariate stats



Association?: NO

Cosyn et al.
COIR 2011, JCP2012ab ,COIR2013
n=115 pat.
Multivariate stats

Association?: NO

Studying esthetic outcome and anatomic dimensions

Outcome measure (i.e. measured as a change from baseline)

Bone level

Buccally	**Clinic**	Radiographic
Proximally	**Clinic**	**Radiographic**

Soft tissue:

Appearance	Clinic	**Photographic**
Level	Clinic	**Photographic/models**

Buccally - Proximally

Tissue level implants

Gallucci et al.
JCP 2011
n=20 pat.
Multivariate stats

Association?: NO

Henriksson&Jemt
CIDRR 2004
n=18 pat.
Bivariate stats

Association?: NO

Palmer et al.
JCP 2007
n=66 pat.
Bivariate stats

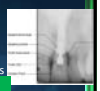
Association?: NO

Schropp et al.
COIR 2005, 2013, 2014ab
n=72 pat.
Bivariate stats

+ cbCT (2014)

Association?: NO

Ryser et al.
JOMS 2005
n=40 pat.
Multivariate stats



Association?: YES

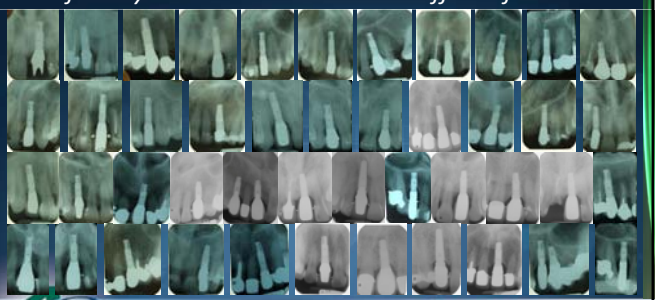
Degidi et al.
J Perio 2008
n=49 pat.
Bivariate stats

Association?: YES

Tymstra et al. & vanNimwegen et al.
JCP2011 & IJP 2015
n=45 pat.
Multivariate stats

Association?: NO

A satisfactory esthetic outcome as an effect of bone level?



Studying bone levels and anatomic dimensions

Outcome measure (i.e. measured as a change from baseline)

Bone level

Buccally	Clinic	Radiographic
Proximally	**Clinic**	**Radiographic**

Soft tissue:

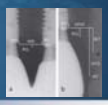
Appearance	Clinic	Photographic
Level	Clinic	Photographic/models
Buccally -	Proximally	

Jemt
IJP 2008
n=38 pat.
Bivariate stats
Association?: NO

Cardaropoli et al.
COIR 2003
n=28 pat.
Multivariate stats
Association?: NO

BICON implants
Urdaneta et al.
COIR 2014
n=206 pat.
Multivariate stats
Association?: NO

Chang&Wennstrom
COIR 2010
n=43 pat.
Multivariate stats
Association?: NO



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Outcome measure (i.e. measured as a change from baseline)

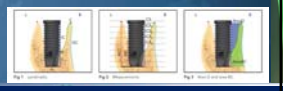
The advent of use of cbCT, pre- & post-placement

Miyamoto & Obama (2011)
Benic et al. (2012-2011e)
Roe et al. (2012)
Vera et al. (2012)
Buser et al. (2013a,b)
Cortes et al. (2013)
Fu et al. (2014-2013e)
Koutouzis et al. (2015, 2014)
Kaminaka et al. (2015-2014e)
Schropp et al. (2015-2014e)
Hasan et al. (2015)
Lemes et al. (2015)
Chappuis et al. (2015e)
Noelken et al. (2015e)
Veltri et al. (2016-2015e)
Kuchler et al. (2016-2015e)

Association?: NO

From: Sanz et al. / Tomasi et al. / Ferrus et al. / Multicentre study. COIR 2010

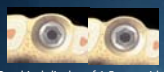
After 3 years: Both the interproximal papilla filling and the midfacial mucosa stability were not influenced by variables such as type of fixture configuration, tooth category, smoke habit, and thickness of buccal bone wall of ≤ 1 mm (thin buccal wall). (Cecchinato et al. COIR 2015)



Rossi et al. - IJPRD 2013 – 9 pat. Bivariate stats – pre-post- 4 mths

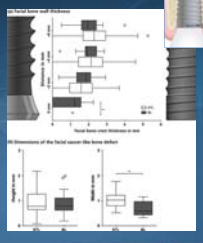
Studying esthetic outcome and anatomic dimensions

Outcome measure (i.e. measured as a change from baseline)



Graphical display of 1.5 mm wide "saucers" claimed to be present around all implants

From: Grunder et al. IJPRD 2005



Chappuis et al. COIR 2015
N= 61 pat.
Bivariate stats, Pre-post 5-9 yrs

Hor. dist. of "saucer" :
TL: 1.0 mm
BL: 0.6 mm

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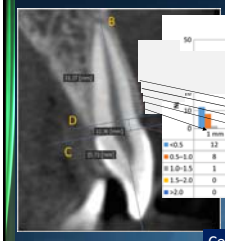
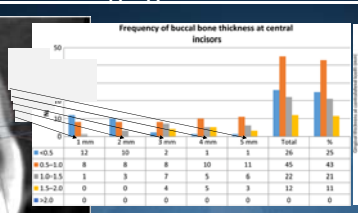
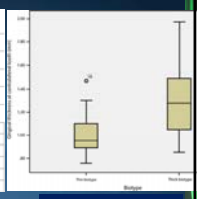
Buccal bone vz. gingival thickness vz. esthetics?







Gingival thickness,
Thin vs thick biotype

N= 21 pat.

Correlation between buccal bone & gingival thickness is only moderate

From:
De Bruyckere et al. JCP 2015
Younes et al. COIR 2016

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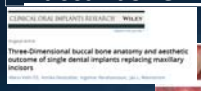
Buccal bone vz. gingival thickness vz. esthetics?



COIR LAST ISSUE!

COIR 2016; 27: 956: "Within present limitations, acceptable and stable aesthetics are not jeopardized by a thin or missing buccal bone"

N= 12 pat.

Association?: NO

BUT!

cbCT accuracy of ≤1.2 mm peri-implant buccal bone ?

Poor (Schulze et al. 2001)
Poor (Spin-Netto et al. 2011)
Poor (Benic et al. 2013)
Modest (Gonzales et al. 2016)

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Summarizing – Take home message

1. Evaluation systems to appraise the qualities of the soft tissues in patients having received a single crown

PES & PES/WES have been validated and appear to predominate in use

2. The effects of various clinical variables on peri-implant soft tissue appearance and cortical bone loss

Effects of many variables singularly and in combination are largely unknown, principally due to small datasets and short study duration

3. Clinical research focused on dimensional relationships between the implant-crown-complex and clinical and radiographical landmarks

Cross-sectional studies with simplistic statistics indicate associations, while longitudinal studies with adequate multi-level multivariate statistics provide less conclusive data

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Thank you for your kind attention
asbjorn.jokstad@uit.no
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