# Straumann Scientific Highlights

SHORT OVERVIEWS ON RECENTLY PUBLISHED SCIENTIFIC EVIDENCE.

## 6th ITI Consensus Conference 2018

SPECIAL ISSUE

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# Content

# In this issue…

During the 6th ITI Consensus Conference held on 17-19 April 2018 in Amsterdam, world-renowned clinicians and researchers meet to discuss crucial topics in dental implantology and agree on consensus statements, clinical guidelines and recommendations for future research.

Selected findings

1. "Advanced age alone is not a contraindication for implant therapy."
   *Heitz-Mayfield L et al. 2018*

2. "The literature supports the use of various implant numbers to support full-arch fixed prostheses."
   *Morton D et al. 2018*

3. "The use of intentionally tilted dental implants is indicated when appropriate conditions exist."
   *Morton D et al. 2018*

4. "Patient-reported outcome measures should be gathered in every clinical study in which the outcomes of oral rehabilitation with dental implants are investigated."
   *Feine J et al. 2018*

# Group 1

The influence of implant length and design and medications on clinical and patient-reported outcomes.

Clin Oral Implants Res. 2018 Oct;29 Suppl 16:69-77

## Group 1 ITI Consensus Report: The influence of implant length and design and medications on clinical and patient-reported outcomes

*Jung RE, Al-Nawas B, Araujo M, Avila-Ortiz G, Barter S, Brodala N, Chappuis V, Chen B, De Souza A, Almeida RF, Fickl S, Finelle G, Ganeles J, Gholami H, Hammerle C, Jensen S, Jokstad A, Katsuyama H, Kleinheinz J, Kunavisarut C, Mardas N, Monje A, Papaspyridakos P, Payer M, Schiegnitz E, Smeets R, Stefanini M, Ten Bruggenkate C, Vazouras K, Weber HP, Weingart D, Windisch P*

## Study objectives

The aim of Working group 1 was to address the influence of different local (implant length, diameter, and design) and systemic (medications) factors on clinical, radiographic, and patient-reported outcomes in implant dentistry. Focused questions on

a) short posterior dental implants (≤6 mm),

b) narrow diameter implants,

c) implant design (tapered compared to a non-tapered implant design), and

d) medication-related dental implant failures were addressed.

## Results and conclusions

- Short implants (≤6 mm) revealed a survival rate ranging from 86.7% to 100%, whereas standard implant survival rate ranged from 95% to 100% with a follow-up from 1 to 5 years. Short implants demonstrated a higher variability and a higher Risk Ratio [RR: 1.24 (95% CI: 0.63, 2.44, p = 0.54)] for failure compared to standard implants. It is concluded that short implants (≤6 mm) are a valid option in situations of reduced bone height to avoid possible morbidity associated with augmentation procedures; however, they reveal a higher variability and lower predictability in survival rates.
- Narrow diameter implants (NDI) have been classified into three categories: Category 1: Implants with a diameter of <2.5 mm ("Mini-implants"); Category 2: Implants with a diameter of 2.5 mm to <3.3 mm; Category 3: Implants with a diameter of 3.3 mm to 3.5 mm. Mean survival rates were 94.7 ± 5%, 97.3 ± 5% and 97.7 ± 2.3% for category 1, 2 and 3.
- Tapered versus non-tapered implants demonstrated only insignificant differences regarding clinical, radiographic, and patient-reported outcomes.
- The intake of certain selective serotonin reuptake inhibitors and proton pump inhibitors is associated with a statistically significant increased implant failure rate. The intake of bisphosphonates related to the treatment of osteoporosis was not associated with an increased implant failure rate.

*Adapted from Jung RE et al., Clin Oral Implants Res. 2018 Oct;29 Suppl 16:69-77*


## Systematic reviews

**Papaspyridakos P**, De Souza A, Vazouras K, Gholami H, Pagni S, Weber HP. Survival rates of short dental implants (≤6 mm) compared with implants longer than 6 mm in posterior jaw areas: A meta-analysis. Clin Oral Implants Res. 2018 Oct;29 Suppl 16:8-20. FREE FULL TEXT

**Schiegnitz E**, Al-Nawas B Narrow-diameter implants: A systematic review and meta-analysis. Clin Oral Implants Res. 2018 Oct;29 Suppl 16:21-40. FREE FULL TEXT

**Jokstad A**, Ganeles J. Systematic review of clinical and patient-reported outcomes following oral rehabilitation on dental implants with a tapered compared to a non-tapered implant design. Clin Oral Implants Res. 2018 Oct;29 Suppl 16:41-54. FREE FULL TEXT

**Chappuis V**, Avila-Ortiz G, Araújo MG, Monje A. Medication-related dental implant failure: Systematic review and meta-analysis. Clin Oral Implants Res. 2018 Oct;29 Suppl 16:55-68. FREE FULL TEXT

Clin Oral Implants Res. 2018 Oct;29 Suppl 16:215-223

## Group 2 ITI Consensus Report: Prosthodontics and implant dentistry.

*Morton D, Gallucci G, Lin WS, Pjetursson B, Polido W, Roehling S, Sailer I, Aghaloo T, Albera H, Bohner L, Braut V, Buser D, Chen S, Dawson A, Eckert S, Gahlert M, Hamilton A, Jaffin R, Jarry C, Karayazgan B, Laine J, Martin W, Rahman L, Schlegel A, Shiota M, Stilwell C, Vorster C, Zembic A, Zhou W.*

## Study objectives

The aim of Working group 2 was to address topics relevant to prosthodontics and dental implants. Systematic reviews were developed according to focused questions addressing

a) the number of implants required to support fixed full-arch restorations,
b) the influence of intentionally tilted implants compared to axial positioned implants when supporting fixed dental prostheses (FDPs),
c) implant placement and loading protocols,
d) zirconia dental implants,
e) zirconia and metal ceramic implant supported single crowns and (f) zirconia and metal ceramic implant supported FDPs.

## Results and conclusions

- The literature supports the use of various implant numbers to support full-arch fixed prostheses.
- The use of intentionally tilted dental implants is indicated when appropriate conditions exist.
- Implant placement and loading protocols should be considered together when planning and treating patients.
- One-piece zirconia dental implants can be recommended when appropriate clinical conditions exist although two-piece zirconia implants should be used with caution as a result of insufficient data.
- Clinical performance of zirconia and metal ceramic single implant supported crowns is similar and each demonstrates significant, though different, complications.
- Zirconia ceramic FDPs are less reliable than metal ceramic. Implant supported monolithic zirconia prostheses may be a future option with more supporting evidence.

*Adapted from Morton D et al., Clin Oral Implants Res. 2018 Oct;29 Suppl 16:215-223* FREE FULL TEXT

## Systematic reviews

**Lin WS,** Eckert SE. Clinical performance of intentionally tilted implants versus axially positioned implants: A systematic review. Clin Oral Implants Res. 2018 Oct;29 Suppl 16:78-105. FREE FULL TEXT

**Gallucci GO**, Hamilton A, Zhou W, Buser D, Chen S Implant placement and loading protocols in partially edentulous patients: A systematic review. Clin Oral Implants Res. 2018 Oct;29 Suppl 16:106-134. FREE FULL TEXT

**Roehling S**, Schlegel KA, Woelfler H, Gahlert M Performance and outcome of zirconia dental implants in clinical studies: A meta-analysis. Clin Oral Implants Res. 2018 Oct;29 Suppl 16:135-153. FREE FULL TEXT

**Daudt Polido W,** Aghaloo T, Emmett TW, Taylor TD, Morton D Number of implants placed for complete-arch fixed prostheses: A systematic review and meta-analysis. Clin Oral Implants Res. 2018 Oct;29 Suppl 16:154-183. FREE FULL TEXT

**Sailer I,** Strasding M, Valente NA, Zwahlen M, Liu S, Pjetursson BE. A systematic review of the survival and complication rates of zirconia-ceramic and metal-ceramic multiple-unit fixed dental prostheses. Clin Oral Implants Res. 2018 Oct;29 Suppl 16:184-198. FREE FULL TEXT

**Pjetursson BE,** Valente NA, Strasding M, Zwahlen M, Liu S, Sailer I.A systematic review of the survival and complication rates of zirconia-ceramic and metal-ceramic single crowns. Clin Oral Implants Res. 2018 Oct;29 Suppl 16:199-214. FREE FULL TEXT

# Group 3

Patient-reported outcome measures associated with implant dentistry.

Clin Oral Implants Res. 2018 Oct;29 Suppl 16:270-275

## Group 3 ITI Consensus Report: Patient-reported outcome measures associated with implant dentistry.

*Feine J, Abou-Ayash S, Al Mardini M, de Santana RB, Bjelke-Holtermann T, Bornstein MM, Braegger U, Cao O, Cordaro L, Eycken D, Fillion M, Gebran G, Huynh-Ba G, Joda T, Levine R, Mattheos N, Oates TW, Abd-Ul-Salam H, Santosa R, Shahdad S, Storelli S, Sykaras N, Treviño Santos A, Stephanie Webersberger U, Williams MAH, Wilson TG Jr, Wismeijer D, Wittneben JG, Yao CJ, Zubiria JPV*

## Study objectives

The aim of Working Group 3 was to focus on three topics that were assessed using patient-reported outcome measures (PROMs). These topics included the following:

a) the aesthetics of tooth and implant-supported fixed dental prostheses focusing on partially edentulous patients,
b) a comparison of fixed and removable implant-retained prostheses for edentulous populations, and
c) immediate versus early/conventional loading of immediately placed implants in partially edentate patients.

PROMs include ratings of satisfaction and oral health-related quality of life (QHRQoL), as well as other indicators, that is, pain, general health-related quality of life (e.g., SF-36).

## Results and conclusions

- Patients were very satisfied with the aesthetics of implant-supported fixed dental prostheses and the surrounding mucosa.
- Implant neck design, restorative material, or use of a provisional restoration did not influence patients' ratings.
- Edentulous patients highly rate both removable and fixed implant-supported prostheses. However, they rate their ability to maintain their oral hygiene significantly higher with the removable prosthesis.
- Both immediate provisionalization and conventional loading receive positive patient-reported outcomes.
- Patient-reported outcome measures should be gathered in every clinical study in which the outcomes of oral rehabilitation with dental implants are investigated.
- PROMs, such as patients' satisfaction and QHRQoL, should supplement other clinical parameters in our clinical definition of success.

*Adapted from Feine J et al., Clin Oral Implants Res. 2018 Oct;29 Suppl 16:270-275*

FREE FULL TEXT

## Systematic reviews

**Wittneben JG,** Wismeijer D, Brägger U, Joda T, Abou-Ayash S Patient-reported outcome measures focusing on aesthetics of implant- and tooth-supported fixed dental prostheses: A systematic review and meta-analysis. Clin Oral Implants Res. 2018 Oct;29 Suppl 16:224-240. FREE FULL TEXT

**Yao CJ,** Cao C, Bornstein MM, Mattheos N Patient-reported outcome measures of edentulous patients restored with implant-supported removable and fixed prostheses: A systematic review. Clin Oral Implants Res. 2018 Oct;29 Suppl 16:241-254. FREE FULL TEXT

**Huynh-Ba G,** Oates TW, Williams MAH. Immediate loading vs. early/conventional loading of immediately placed implants in partially edentulous patients from the patients' perspective: A systematic review. Clin Oral Implants Res. 2018 Oct;29 Suppl 16:255-269. FREE FULL TEXT

# Group 4

Risks and biologic complications associated with implant dentistry

Clin Oral Implants Res. 2018 Oct;29 Suppl 16:351-358

## Group 4 ITI Consensus Report: Risks and biologic complications associated with implant dentistry

*Heitz-Mayfield LJ, Aaboe M, Araujo M, Carrión JB, Cavalcanti R, Cionca N, Cochran D, Darby I, Funakoshi E, Gierthmuehlen PC, Hashim D, Jahangiri L, Kwon Y, Lambert F, Layton DM, Lorenzana ER, McKenna G, Mombelli A, Müller F, Roccuzzo M, Salvi GE, Schimmel M, Srinivasan M, Tomasi C, Yeo A*

## Study objectives

The aim of Working Group 4 was to address topics related to biologic risks and complications associated with implant dentistry.

Focused questions on

a) diagnosis of peri-implantitis,
b) complications associated with implants in augmented sites,
c) outcomes following treatment of peri-implantitis, and
d) implant therapy in geriatric patients and/or patients with systemic diseases

were addressed.

## Results and conclusions

- Bleeding on probing (BOP) alone is insufficient for the diagnosis of peri-implantitis. The positive predictive value of BOP alone for the diagnosis of peri-implantitis varies and is dependent on the prevalence of peri-implantitis within the population. Diagnosis of peri-implantitis requires the presence of BOP as well as progressive bone loss.
- For patients with implants in augmented sites, the prevalence of peri-implantitis and implant loss is low over the medium to long term.
- Peri-implantitis treatment protocols which include individualized supportive care result in high survival of implants after 5 years with about three-quarters of implants still present.
- Advanced age alone is not a contraindication for implant therapy.
- Implant placement in patients with cancer receiving high-dose antiresorptive therapy is contraindicated due to the associated high risk for complications.

*Adapted from Heitz-Mayfield L et al., Clin Oral Implants Res. 2018 Oct;29 Suppl 16:351-358*

FREE FULL TEXT

## Systematic reviews

**Hashim D,** Cionca N, Combescure C, Mombelli A The diagnosis of peri-implantitis: A systematic review on the predictive value of bleeding on probing. Clin Oral Implants Res. 2018 Oct;29 Suppl 16:276-293. FREE FULL TEXT

**Salvi GE,** Monje A, Tomasi C Long-term biological complications of dental implants placed either in pristine or in augmented sites: A systematic review and meta-analysis. Clin Oral Implants Res. 2018 Oct;29 Suppl 16:294-310. FREE FULL TEXT

**Schimmel M,** Srinivasan M, McKenna G, Müller F. Effect of advanced age and/or systemic medical conditions on dental implant survival: A systematic review and meta-analysis. Clin Oral Implants Res. 2018 Oct;29 Suppl 16:311-330. FREE FULL TEXT

**Roccuzzo M,** Layton DM, Roccuzzo A, Heitz-Mayfield LJ. Clinical outcomes of peri-implantitis treatment and supportive care: A systematic review. Clin Oral Implants Res. 2018 Oct;29 Suppl 16:331-350. FREE FULL TEXT

Clin Oral Implants Res. 2018 Oct;29 Suppl 16:436-442

# Group 5 ITI Consensus Report: Digital technologies.

*Wismeijer D, Joda T, Flügge T, Fokas G, Tahmaseb A, Bechelli D, Bohner L, Bornstein M, Burgoyne A, Caram S, Carmichael R, Chen CY, Coucke W, Derksen W, Donos N, El Kholy K, Evans C, Fehmer V, Fickl S, Fragola G, Gimenez Gonzales B, Gholami H, Hashim D, Hui Y, Kökat A, Vazouras K, Kühl S, Lanis A, Leesungbok R, van der Meer J, Liu Z, Sato T, De Souza A, Scarfe WC, Tosta M, van Zyl P, Vach K, Vaughn V, Vucetic M, Wang P, Wen B, Wu V*

## Study objectives

The aim of Working Group 5 was to review the current knowledge in the area of digital technologies. Focused questions on

a) accuracy of linear measurements when using CBCT,
b) digital vs. conventional implant planning,
c) using digital vs. conventional impressions and
d) assessing the accuracy of static computer-aided implant surgery (s-CAIS) and patient-related outcome measurements when using s-CAIS

were addressed.

## Results and conclusions

- Static computer-aided surgery (s-CAIS), in terms of pain & discomfort, economics and intraoperative complications, is beneficial compared with conventional implant surgery. When using s-CAIS in partially edentulous cases, a higher level of accuracy can be achieved when compared to fully edentulous cases.
- When using an intraoral scanner in edentulous cases, the results are dependent on the protocol that has been followed. The accuracy of measurements on CBCT scans is software dependent.
- Because the precision intraoral scans and of measurements on CBCT scans and is not high enough to allow for the required accuracy, s-CAIS should be considered as an additional tool for comprehensive diagnosis, treatment planning, and surgical procedures. Flapless s-CAIS can lead to implant placement outside of the zone of keratinized mucosa and thus must be executed with utmost care.

*Adapted from Wismeijer D et al., Clin Oral Implants Res. 2018 Oct;29 Suppl 16:436-442*


## Systematic reviews

**Joda T,** Derksen W, Wittneben JG, Kuehl S Static computer-aided implant surgery (s-CAIS) analysing patient-reported outcome measures (PROMs), economics and surgical complications: A systematic review. Clin Oral Implants Res. 2018 Oct;29 Suppl 16:359-373. FREE FULL TEXT

**Flügge T,** van der Meer WJ, Gonzalez BG, Vach K, Wismeijer D, Wang P. The accuracy of different dental impression techniques for implant-supported dental prostheses: A systematic review and meta-analysis. Clin Oral Implants Res. 2018 Oct;29 Suppl 16:374-392. FREE FULL TEXT

**Fokas G,** Vaughn VM, Scarfe WC, Bornstein MM Accuracy of linear measurements on CBCT images related to presurgical implant treatment planning: A systematic review. Clin Oral Implants Res. 2018 Oct;29 Suppl 16:393-415. FREE FULL TEXT

**Tahmaseb A,** Wu V, Wismeijer D, Coucke W, Evans C. The accuracy of static computer-aided implant surgery: A systematic review and meta-analysis. Clin Oral Implants Res. 2018 Oct;29 Suppl 16:416-435. FREE FULL TEXT

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