

Literatur

Oberflächendekontamination biofilmbesiedelter Implantatoberflächen – PDT versus Diodenlaser

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1. Abt E. Growing body of evidence on survival rates of implant-supported fixed prostheses. *Evid Based Dent* 2008;9:51-52.
2. Adell R, Hansson BO, Brånemark PI, Breine U. Intra-osseous anchorage of dental prostheses. II. Review of clinical approaches. *Scand J Plast Reconstr Surg* 1970;4:19-34.
3. Albrektsson T, Isidor F. Consensus report of session IV. In: Lang NP, Karring T. *Proceedings of the 1st European Workshop on Periodontology*. Quintessence, Berlin 1994, pp 365-369.
4. Alsaadi G, Quirynen M, Komárek A, van Steenberghe D. Impact of local and systemic factors on the incidence of late oral implant loss. *Clin Oral Implants Res* 2008;19:670-676.
5. Anitua E, Orive G, Aguirre JJ, Ardanza B, Andía I. 5-year clinical experience with BTI dental implants: Risk factors for implant failure. *J Clin Periodontol* 2008;35:724-732.
6. Aoki M, Takanashi K, Matsukubo T, Yajima Y, Okuda K, Sato T, Ishihara K. Transmission of periodontopathic bacteria from natural teeth to implants. *Clin Implant*

Dent Relat Res 2012;14:406-411.

7. Assenza B, Tripodi D, Scarano A, Perrotti V, Piattelli A, Iezzi G, D'Ercole S. Bacterial leakage in implants with different implant-abutment connections: an in vitro study. J Periodontol 2012;83:491-497.
8. Astrand P, Engquist B, Anzen B. A three-year follow-up report of a comparative study of ITI dental Implants and Branemark system implants in the treatment of the partially edentulous maxilla. Clin Implant Dent Relat Res 2004;6: 130-141.
9. Astrand P, Ahlqvist J, Gunne J, Nilson H. Implant treatment of patients with edentulous jaws: a 20-year follow-up. Clin Implant Dent Relat Res 2008;10: 207-217.
10. Augthun M, Tinschert J, Huber A. In vitro studies on the effect of cleaning methods on different implant surfaces. J Periodont 1998;69:857-864.
11. Baelum V, Ellegaard B. Implant survival in periodontally compromised patients. J Periodontol 2004;75:1404-1412.
12. Bartsch A. Patientencompliance: Vertrauen ist gut, Kontrolle ist besser? Plaque'n'Care 2006;2:36-42.
13. Bastendorf KD. Recall in der Prophylaxepaxis. Spitta, Balingen 2000.
14. Bastendorf KD. Antimikrobielle photodynamische Therapie (aPDT) – aus der Praxis für die Praxis. Plaque'n'Care 2007;3:1-3.
15. Bastendorf KD. Recall und Implantate. Jahrb Implantol 2012a;1:140-142.
16. Bastendorf KD. Langzeiterfolge der Praxisprophylaxe nach 30 Jahren. Prophylaxe Impuls 2012b;16:62-69.
17. Bastendorf KD. Strategie der Kariesprophylaxe. Plaque'n'Care 2012c;1:24-27.

18. Bastendorf KD, Laurisch L. Langzeiterfolge der systematischen Kariesprophylaxe.
Dtsch Zahnärztl Z 2009;64:548-557.
19. Berglundh T, Lindhe J, Ericsson I, Marinello CP, Liljenberg B, Thomsen P. The soft tissue barrier at implants and teeth. Clin Oral Implants Res 1991;2:81-90.
20. Berglundh T, Lindhe J, Jonsson K. The topography of the vascular system in the periodontal and peri-implant tissues in the dog. J Clin Periodontol 1994; 21:189-193.
21. Berglundh T, Persson L, Klinge B. A systematic review of the incidence of biological and technical complications in implant dentistry reported in prospective longitudinal studies of at least 5 years. J Clin Periodontol 2002;29 Suppl 3:197-212.
22. Berglundh T, Abrahamsson I, Welander M, Lang NP, Linde J. Morphogenesis of the periimplant mucosa: An experimental study in dogs. Clin Oral Implants Res 2007; 18:1-8.
23. Bergström J. Periodontitis and smoking: an evidence-based appraisal. J Evid Based Dent Pract 2006;6: 33-41.
24. Besimo CE, Guindy JS, Lewetag D, Meyer J. Prevention of bacterial leakage into and from prefabricated screw-retained crowns on implants in vitro. Int J Oral Maxillofac Implants 1999;14:654-660.
25. Bories C, Struillou X, Badran Z, Soueidan A. Periimplantitis: Methoden und Techniken zur Desinfektion von Implantatoberflächen. Schweiz Monatsschr Zahnmed 2011;121:341-355.

26. Brånemark PI, Adell R, Breine U, Hansson BO, Lindström J, Ohlsson A. Intra- osseous anchorage of dental prostheses. I. Experimental studies. *Scand J Plast Reconstr Surg* 1969;3:81-100.
27. Buchmann R, Khoury F, Müller RU, Lange D. Die Therapie der progressiven marginalen Parodontitis und Periimplantitis. *Dtsch Zahnärztl Z* 1997;52:421-426.
28. Carcuac O, Jansson L. Peri-implantitis in a specialist clinic of periodontology. Clinical features and risk indicators. *Swed Dent J* 2010;34:53-61.
29. Charyeva O, Altynbekov K, Zhartybaev R, Sabdanaliev A. Long-term dental implant success and survival - a clinical study after an observation period up to 6 years. *Swed Dent J* 2012;36:1-6.
30. Cho-Yan Lee J, Mattheos N, Nixon KC, Ivanovski S. Residual periodontal pockets are a risk indicator for peri-implantitis in patients treated for periodontitis. *Clin Oral Implants Res* 2012;23:325-333.
31. Chung DM, Oh TJ, Lee J, Misch CE, Wang HL. Factors affecting late implant bone loss: a retrospective analysis. *Int J Oral Maxillofac Implants* 2007;22, 117-126.
32. Corbella S, Del Fabbro M, Taschieri S, De Siena F, Francetti L. Clinical evaluation of an implant maintenance protocol for the prevention of peri-implant diseases in patients treated with immediately loaded full-arch rehabilitations. *Int J Dent Hyg* 2011; 9:216-222.
33. Costa FO, Takenaka-Martinez S, Cota LO, Ferreira SD, Silva GL, Costa JE. Peri- implant disease in subjects with and without preventive maintenance: a 5-year follow- up. *J Clin Periodontol* 2012;39:173-181.
34. De Araújo Nobre M, Cintra N, Maló P. Peri-implant maintenance of immediate function implants: a pilot study comparing hyaluronic acid and chlorhexidine. *Int J Dent Hyg* 2007;5:87-94.

35. Dörtbudak O, Haas R, Dörtbudak-Kneissl E, Bernhart T, Mailath-Pokorny G. Die photodynamische Therapie: Eine neue Methode zur Dekontamination von Implantatoberflächen bei der Behandlung der Periimplantitis. *Stomatologie* 2000;97:67-71.
36. Donos N, Laurell L, Mardas N. Hierarchical decisions on teeth vs. implants in the periodontitis-susceptible patient: the modern dilemma. *Periodontol* 2000 2012; 59:89-110.
37. Ellegaard B, Baelum V, Karring T. Implant therapy in periodontally compromised patients. *Clin Oral Implants Res* 1997;8:180-188.
38. Esposito M, Hirsch J, Lekholm U, Thomsen P. Differential diagnosis and treatment strategies for biologic complications and failing oral implants: A review of the literature. *Int J Oral Maxillofac Implants* 1999;14:473-490.
39. Esposito M, Worthington HV, Thomsen P, Coulthard P. Interventions for replacing missing teeth: maintaining health around dental implants. *Cochrane Database Syst Rev* 2004 (3):CD003069.
40. Esposito M, Murray-Curtis L, Grusovin MG, Coulthard P, Worthington HV. Interventions for replacing missing teeth: different types of dental implants. *Cochrane Database Syst Rev* 2007 (4):CD003815.
41. Esposito M, Grusovin MG, Worthington HV. Interventions for replacing missing teeth: treatment of peri-implantitis. *Cochrane Database Syst Rev* 2012;1: CD004970.
42. Ferreira SD, Silva GL, Cortelli JR, Costa JE, Costa FO. Prevalence and risk variables for peri-implant disease in Brazilian subjects. *J Clin Periodontol* 2006;33:929-935.
43. Flemmig TF, Hetzel M, Topoll H, Gerss J, Haberlein I, Petersilka GJ. Subgingival debridement efficacy of glycine powder air-polishing. *J Periodontol* 2007; 78:1002-

1010.

44. Flemmig TF, Arushanov D, Daubert D, Rothen M, Mueller G, Leroux BG. Randomized controlled trial assessing efficacy and safety of glycine powder air polishing in moderate-to-deep periodontal pockets. *J Periodontol* 2012;83: 444-452.
45. Fisnik K. Entfernung eines bakteriellen Biofilm von Implanatoberflächen, Dissertation
Universitätsklinikum Hamburg-Eppendorf (2012)
46. Fox SC, Moriarti JD, Kusty RP. The effects of scaling a titanium implant surface with metal and plastic instruments: an in vitro study. *J Periodontol* 1990; 61:485-490.
47. Fransson C, Wennström J, Berglundh T. Clinical characteristics at implants with a history of progressive bone loss. *Clin Oral Implants Res* 2008;19:142-147.
48. Fritzscheier CU. Periimplantitis: Prophylaxe bei zusammengesetzten Implantaten.
ZWP spezial 2008;7/8:20-25
49. Froum SJ, Rosen PS. A proposed classification for peri-implantitis. *Int J Periodontics Restorative Dent* 2012;32:533-540.
50. Gatti C, Gatti F, Chiapasco M, Esposito M. Outcome of dental implants in partially edentulous patients with and without a history of periodontitis: a 5-year interim analysis of a cohort study. *Eur J Oral Implantol* 2008;1:45-51.
51. Gomes SC, Piccinin FB, Susin C, Oppermann RV, Marcantonio RA. Effect of supragingival plaque control in smokers and never-smokers: 6-month evaluation of patients with periodontitis. *J Periodontol* 2007;78:1515–1521.
52. Gosau M, Hahnel S, Schwarz F, Gerlach T, Reichert TE, Bürgers R. Effect of

six different peri-implantitis disinfection methods on in vivo human oral biofilm. *Clin Oral Implants Res* 2010;21:866-872.

53. Graziani F, Figuera E, Herrera D. Systematic review of quality of reporting, outcome measurements and methods to study efficacy of preventive and therapeutic approaches to peri-implant diseases. *J Clin Periodontol* 2012;39 Suppl 12:224-244.
54. Gross M, Abramovich I, Weiss, E: Microleakage at the abutment-implant interface of osseointegrated implants: a comparative study. *Int J Oral Maxillofac Implants* 1999;14:94-100.
54. Gruica B, Wang HY, Lang NP, Buser D. Impact of IL-1 genotype and smoking status on the prognosis of osseointegrated implants. *Clin Oral Implants Res* 2004;15: 393-400.
56. Grusovin MG, Coulthard P, Jourabchian E, Worthington HV, Esposito MA. Interventions for replacing missing teeth: maintaining and recovering soft tissue health around dental implants. *Cochrane Database Syst Rev* 2008 (1): CD003069.
57. Grusovin MG, Coulthard P, Worthington HV, George P, Esposito M. Interventions for replacing missing teeth: maintaining and recovering soft tissue health around dental implants. *Cochrane Database Syst Rev* 2010 (8): CD003069.
58. Guentsch A, Perschaw PM. The use of a linear oscillating device in periodontal treatment: a review. *J Clin Periodontol* 2008;35:514-524.
59. Haas R, Haimbock W, Mailath G, Watzek G. The relationship of smoking on peri-implant tissue: a retrospective study. *J Prosthet Dent* 1996;76:592-596.
60. Hallström H, Persson GR, Lindgren S, Olofsson M, Renvert S. Systemic antibiotics and débridement of peri-implant mucositis. A randomized clinical trial. *J Clin Periodontol* 2012;39:574-581.

61. Hanes PJ. Local anti-infective therapy: pharmacological agents. A systematic review.
Ann Periodontol 2003;8:79-88.
62. Heasman PA, McCracken GI, Steen N. Supportive periodontal care: The effect of periodic subgingival débridement compared with supragingival prophylaxis with respect to clinical outcomes. J Clin Periodontol 2002;29 Suppl. 3:163-172.
63. Heitz-Mayfield LJ. Peri-implant diseases: diagnosis and risk indicators. J Clin Perio- dontol 2008;35:292-304.
64. Heitz-Mayfield LJ, Huynh-Ba G. History of treated periodontitis and smoking as risks for implant therapy. Int J Oral Maxillofac Implants 2009;24 Suppl:39-68.
65. Heitz-Mayfield LJ, Lang NP. Antimicrobial treatment of peri-implant diseases. Int J Oral Maxillofac Implants 2004;19 Suppl:128-139.
66. Henry PJ, Bower RC, Wall CD. Rehabilitation of the edentulous mandible with osseointegrated dental implants: 10 year follow-up. Aust Dent J 1995;40:1-9.
67. Homiak AW, Cook PA, De Boor J. Effect of hygiene instrumentation on titanium abutments: a scanning electron microscopy study. J Prosth Dent 1992; 67:364-369.
68. Hugoson A, Hultin M, Gustafsson A, Klinge B. Long-term evaluation of osseointegra- ted dental implants in the treatment of partly edentulous patients. J Clin Periodontol 2000;27:128-133.
69. Hugoson A, Sjödin B, Norderyd O. Trends over 30 years, 1973-2003, in the preva- lence and severity of periodontal disease. J Clin Periodontol 2008;35: 405-414.
70. Hultin M, Gustafsson A, Hallstrom H, Johansson L, Ekfeldt A, Klinge B.

Micro- biological findings and host response in patients with periimplantitis. Clin Oral Implants Res 2002;13:349-358.

71. Hultin M, Komiyama A, Klinge B. Supportive therapy and the longevity of dental implants: a systematic review of the literature. Clin Oral Implants Res 2007;18 Suppl 3:50-62.
72. Ibrahim Z, Tschernitschek H, Rossbach A. Versiegelung der Implantatkomponenten des Brånemark-Systems. Implantologie 2003;11:161-167.
73. Jansen VK, Conrads G, Richter EJ. Microbial leakage and marginal fit of the implant- abutment interface. Int J Oral Maxillofac Implants 1997;12:527-540.
74. Jansson H, Hamberg K, De Bruyn H, Bratthall G. Clinical consequences of IL-1 genotype on early implant failures in patients under periodontal maintenance. Clin Implant Dent Relat Res 2005;7:51-59.
75. Karoussis IK, Salvi GE, Heitz-Mayfield LJ, Brägger U, Hämmerle CH, Lang NP. Long- term implant prognosis in patients with and without a history of chronic periodontitis: a 10-year prospective cohort study of the ITI Dental Implant System. Clin Oral Implants Res 2003;14:329-339.
76. Karoussis IK, Müller S, Salvi GE, Heitz-Mayfield LJ, Brägger U, Lang NP. Association between periodontal and peri-implant conditions: a 10-year prospective study. Clin Oral Implants Res 2004a;15:1-7.
77. Karoussis IK, Brägger U, Salvi GE, Bürgin W, Lang NP. Effect of implant design on survival and success rates of titanium oral implants: a 10-year prospective cohort study of the ITI Dental Implant System. Clin Oral Implants Res 2004b;15:8-17.
78. Karoussis IK, Kotsovilis S, Fourmouis I. A comprehensive and critical review of dental implant prognosis in periodontally compromised partially edentulous patients. Clin Oral Implants Res 2007;18:669-679.

79. Karring ES, Stavropoulos A, Ellegaard B, Karring T. Treatment of peri-implantitis by the Vector system. *Clin Oral Implants Res* 2005;16:288-293.
80. Kawashima H, Sato S, Kishida M, Yagi H, Matsumoto K, Ito K. Treatment of titanium dental implants with three piezoelectric ultrasonic scalers: an in vivo study. *J Periodontol* 2007;78:1689-1694.
81. Keller W, Brägger U, Mombelli A. Peri-implant microflora of implants with cemented and screw retained suprastructures. *Clin Oral Implants Res* 1998;9:209-217.
82. Kim DM, Badovinac RL, Lorenz RL, Fiorellini JP, Weber HP. A 10-year prospective clinical and radiographic study of one-stage dental implants. *Clin Oral Implants Res* 2008;19:254-258.
83. Kleisner J, Marinello PC, Kundert E, Lüthy H. Prevention of bacterial colonization on implant components in vivo by a topical metronidazole gel. *Acta Med Dent Helv* 1996;1:250-257.
84. Klinge BA, Gustafsson B, Berglundh T. A systematic review of the effect of antiinfective therapy in the treatment of peri-implantitis. *J Clin Periodontol* 2002; 29 Suppl.3:213-225.
85. Koeck B, Wagner W. *Praxis der Zahnheilkunde Implantologie*. 2. Aufl. Urban & Fischer, München 2004.
86. Koldslund OC, Scheie AA, Aass AM. The association between selected risk indicators and severity of peri-implantitis using mixed model analyses. *J Clin Periodontol* 2011;38:285-292.
87. Koutouzis T, Mesia R, Calderon N, Wong F, Wallet S. The effect of dynamic loading on bacterial colonization of the dental Implant fixture-abutment interface: An in-vitro study. *J Oral Implantol* 2012 May 7.

88. Kreisler M, Kohen W, Christoffers AB, Götz H, Jansen B, Duschner H, d'Hoedt B. In vitro evaluation of the biocompatibility of contaminated implant surfaces treated with an Er:YAG laser and an air powder system. *Clin Oral Implants Res* 2005;16:36-43.
89. Lang NP, Nyman SR. Supportive maintenance care for patients with implants and advanced restorative therapy. *Periodontol 2000* 1994;4:119-126.
90. Lang NP, Berglundh T, Heitz-Mayfield LJ, Pjetursson BE, Salvi GE, Sanz M. Consensus statements and recommended clinical procedures regarding implant survival and complications. *Int J Oral Maxillofac Implants* 2004;19 Suppl:150-154.
91. Lekholm U, Gunne J, Henry P, Higuchi K, Lindén U, Bergström C, van Steenberghe D. Survival of the Brånemark implant in partially edentulous jaws: a 10-year prospective multicenter study. *Int J Oral Maxillofac Implants* 1999;14: 639-645.
92. Leonhardt A, Berglundh T, Ericsson I. Putative periodontal pathogens on titanium implants and teeth in experimental gingivitis and periodontitis in beagle dogs. *Clin Oral Implants Res* 1992; 3:112-119.
93. Leonhardt A, Renvert S, Dahlen G. Microbial findings at failing implants. *Clin Oral Implants Res* 1999;10:339-354.
94. Leonhardt A, Gröndahl K, Bergström C, Lekholm U. Long-term follow-up of osseointegrated titanium implants using clinical, radiographic and microbiological parameters. *Clin Oral Implants Res* 2002;13:127-132.
95. Lindhe J, Meyle J, Group D of European Workshop on Periodontology. Peri-implant diseases: Consensus report of the Sixth European Workshop on Periodontology. *J Clin Periodontol* 2008;35 8 Suppl:282-285.
96. Lindquist LW, Rockler B, Carlsson GB. Bone resorption around fixtures in edentulous treated with mandibular fixed tissue – integrated prostheses. *J*

Prosthet Dent

1988;59:59-63.

97. Listgarten MA, Lang NP, Schroeder HE, Schroeder A. Periodontal tissues and their counterparts around endosseous implants. *Clin Oral Implants Res* 1991; 2:1-19.
98. Listgarten MA, Buser D, Steinemann SG, Donath K, Lang NP, Weber HP. Light and transmission electron microscopy of the intact interfaces between non submerged titanium-coated epoxy resin implants and bone or gingiva. *J Dent Res* 1992;71:364-371.
99. Liu X, Lim JY, Donahue HJ, Dhurjati R, Mastro AM, Vogler EA. Influence of substratum surface chemistry/energy and topography on the human fetal osteoblastic cell line hFOB 1.19: Phenotypic and genotypic responses observed in vitro. *Biomaterials* 2007;28:4535-4550.
100. Marotti J, Tortamano P, Cai S, Ribeiro MS, Franco JE, de Campos TT. Decontamination of dental implant surfaces by means of photodynamic therapy. *Lasers Med Sci.* 2012 Jul 12.
101. Marrone A, Lasserre J, Bercy P, Brex MC. Prevalence and risk factors for peri-implant disease in Belgian adults. *Clin Oral Implants Res* 2012. doi: 10.1111/j. 1600-0501.2012.02476.x.
102. McCarthy GR, Guckes AD. Preventing bacterial colonization associated with two types of implant abutments. *J Prosthet Dent* 1993;70:479-480.
103. Meisel P, Kocher T. Photodynamic therapy for periodontal diseases: State of the art. *J Photochem Photobiol B* 2005;79:159-170.
104. Mengel R, Meer C, Flores-de-Jacoby L. The treatment of uncoated and titanium nitride-coated abutments with different instruments. *Int J Oral Maxillofac Implants*

2004;19:232-238.

105. Meyer G, Fanghänel J, Proff P. Morphofunctional aspects of dental implants.
Ann

Anat 2012;194:190-194.

106. Meyle J. Mechanical, chemical and laser treatments of the implant surface
in the presence of marginal bone loss around implants. Eur J Oral
Implantol 2012;5

Suppl:S71-81.

107. Micheelis W, Schiffner U. Vierte Deutsche Mundgesundheits-Studie (DMS IV).
Dtsch

Ärzte-Verlag, Köln 2006.

108. Michel H. Strukturierte Prophylaxe. Helix, München 2002.

109. Mir-Mari J, Mir-Orfila P, Figueiredo R, Valmaseda-Castellón E, Gay-Escoda C.
Prevalence of peri-implant diseases. A cross-sectional study based on a
private practice environment. J Clin Periodontol 2012;39:490-494.

110. Moëne R, Décaillot F, Andersen E, Mombelli A. Subgingival plaque removal
using a new air-polishing device. J Periodontol 2010;81: 79-88.

111. Mombelli A. Etiology, diagnosis, and treatment considerations in peri-implantitis.
Curr

Opin Periodontol 1997;4:127-136.

112. Mombelli A, Lang NP Antimicrobial treatment of periimplant infections. Clin Oral
Implants Res 1992; 3:162-168.

113. Mombelli A, Lang NP. The diagnosis and treatment of peri-implantitis.
Periodontol

2000 1998;17:63-76.

114. MRG (millennium Research Group). European Markets for Dental Implants

2011.

115. Nguyen-Hieu T, Borghetti A, Aboudharam G. Peri-implantitis: from diagnosis to therapeutics. *J Investig Clin Dent* 2012;3:79-94.
116. Norowski PA, Bumgardner JD. Biomaterial and antibiotic strategies for peri- implantitis: a review. *J Biomed Mater Res B Appl Biomater* 2009;88:530-543.
117. Ong CT, Ivanovski S, Needleman IG, Retzepi M, Moles DR, Tonetti MS, Donos N.
Systematic review of implant outcomes in treated periodontitis subjects. *J Clin Periodontol* 2008;35:438-462.
118. Ostman PO, Hellman M, Sennerby L. Ten years later. Results from a prospective single-centre clinical study on 121 oxidized (TiUnite™) Brånemark implants in 46 patients. *Clin Implant Dent Relat Res* 2012;May 29. doi: 10.1111/j.1708-8208.2012.00453.x
119. Paolantonio M, Perinetti G, D'Ercole S, Graziani F, Catamo G, Sammartino G, Piccolomini R. Internal decontamination of dental implants: an in vivo randomized microbiologic 6-month trial on the effects of a chlorhexidine gel. *J Periodontol* 2008;79:419-425.
120. Papapanou PN, Lindhe J. Epidemiology of periodontal disease. In: Lindhe J, Karring T, Lang NP (eds). *Clinical periodontology and implant dentistry*, 5th ed. Blackwell, Munksgaard 2008.
121. Patyk A, Laugisch J, Steinberg JM: Hohlraumversiegelung bei implantatgetragenen
Suprakonstruktionen mit Hilfe acetatvernetzter Silikone. *Z Zahnärztl Implantol* 1997;13:195-198.

122. Pecora GE, Ceccarelli R, Bonelli M, Alexander H, Ricci JL. Clinical evaluation of laser microtexturing for soft tissue and bone attachment to dental implants. *Implant Dent* 2009;18:57-66.
123. Persson LG, Lekholm U, Leonhardt A, Dahlén G, Lindhe J. Bacterial colonization on internal surfaces of Brånemark system implant components. *Clin Oral Implants Res* 1996;7:90-95.
124. Petersilka GJ. Subgingival air-polishing in the treatment of periodontal biofilm infections. *Periodontol 2000* 2011;55:124-142.
125. Petersilka GJ, Steinmann D, Haberlein I, Heinecke A, Flemming TF. Subgingival plaque removal in buccal and lingual sites using a novel low abrasive air-polishing powder. *J Clin Periodontol* 2003a;30:328-333.
126. Petersilka GJ, Tunkel J, Barakos K, Heinecke A, Haberlein I, Flemming TF. Subgingival plaque removal at interdental sites using a low-abrasive air-polishing powder. *J Periodontol* 2003b;74: 307-311.
127. Petersilka GJ, Faggion CM, Stratmann U, Gerss J, Ehmke B, Haeberlein I, Flemming TF. Effect of glycine powder air-polishing on the gingiva. *J Clin Periodontol* 2008;35: 324-332.
128. Piattelli A, Cosci F, Scarano A, Trisi P. Localized chronic suppurative bone infection as a sequel of peri-implantitis in a hydroxyapatite-coated dental implant. *Biomaterials* 1995;16:917-920.
129. Pjetursson BE, Helbling C, Weber HP, Matuliene G, Salvi GE, Brägger U, Schmidlin K, Zwahlen M, Lang NP. Peri-implantitis susceptibility as it relates to periodontal therapy and supportive care. *Clin Oral Implants Res* 2012;23:888-894.

130. Porras R, Anderson GB, Caffesse R, Narendran S, Trejo PM. Clinical response to 2 different therapeutic regimens to treat peri-implant mucositis. *J Periodontol* 2002; 73:1118-1125.
131. Porter JA, von Fraunhofer JA. Success or failure of dental implants? A literature review with treatment considerations. *Gen Dent* 2005;53:423-432.
132. Proff P, Steinmetz I, Bayerlein T, Dietze S, Fanghänel J, Gedrange T. Bacterial colonisation of interior implant threads with and without sealing. *Folia Morphol* 2006;65:75-77.
133. Quirynen M, Bollen CM. The influence of surface roughness and surface-free energy on supra- and subgingival plaque formation in man. A review of the literature. *J Clin Periodontol* 1995;22:1-14.
134. Quirynen M, van Steenberghe D: Bacterial colonization of the internal part of two- stage implants. An in vivo study. *Clin Oral Implants Res* 1993;4:158-161.
135. Quirynen M, van der Mei HC, Bollen CM, Schotte A, Marechal M, Doornbusch GI, Naert I, Busscher HJ, van Steenberghe D. An in vivo study of the influence of the surface roughness of implants on the microbiology of supra- and subgingival plaque. *J Dent Res* 1993;72:1304-1309.
136. Quirynen M, Bollen CL, Eyssen H, van Steenberghe D. Microbial penetration along the implant components of the Brånemark system. An in vitro study. *Clin Oral Impl Res* 1994;5:239-244.
137. Quirynen M, De Soete M, van Steenberghe D. Infectious risks for oral implants: A review of the literature. *Clin Oral Implants Res* 2002;13:1-19.
138. Quirynen M, Abarca M, Van Assche N, Nevins M, van Steenberghe D. Impact of supportive periodontal therapy and implant surface roughness on implant outcome in patients with a history of periodontitis. *J Clin Periodontol* 2007a; 34:805-815.

139. Quirynen M, Van Assche N, Botticelli D, Berglundh T. How does the timing of implant placement to extraction affect outcome? *Int J Oral Maxillofac Implants* 2007b;22
Suppl: 203-223.
140. Rangert B, Gunne J, Sullivan DY. Mechanical aspects of a Brånemark implant connected to a natural tooth: an in vitro study. *Int J Oral Maxillofac Implants* 1991;6:177-186.
141. Razzoog ME, Koka S. In vitro analysis of the effects of two air-abrasive prophylaxis systems and inlet air pressure on the surface of titanium abutment cylinders. *J Prosthodont* 1994;3:103-107.
142. Reich E, Arweiler N, Benz C, Lynch E, Scholz V. Stellenwert des Chlorhexidins in der Implantatversorgung – ein Konsensuspapier. *ZWR*. 2007;07/08 359-362.
143. Renvert S, Persson GR. Periodontitis as a potential risk factor for periimplantitis. *J Clin Periodontol* 2009;36 Suppl 10:9-14.
144. Renvert S, Roos-Jansåker AM, Lindahl C, Renvert H, Persson GR. Infection at titanium implants with or without a clinical diagnosis of inflammation. *Clin Oral Implants Res* 2007;18:509–516.
145. Renvert S, Roos-Jansåker AM, Claffey N: Non-surgical treatment of periimplant mucositis and periimplantitis: A literature review. *J Clin Periodontol* 2008;35:305-315.
146. Renvert S, Samuelsson E, Lindahl C, Persson GR. Mechanical non-surgical treatment of peri-implantitis: a double-blind randomized longitudinal clinical study. I: Clinical results. *J Clin Periodontol* 2009;36:604-609.
147. Rogge S, Kielbassa AM. Periimplantäre Erkrankungen. Periimplantitisprophylaxe und

Implantatpflege. *Dentalhygiene J* 2004;1:12-15.

148. Roos-Jansåker AM. Long-time follow up of implant therapy and treatment of peri- implantitis. *Swed Dent J Suppl* 2007;188:7-66.
149. Roos-Jansåker AM, Lindahl C, Renvert H, Renvert S: Nine- to fourteen-year follow-up of implant treatment. Part II: presence of peri-implant lesions. *J Clin Periodontol* 2006a;33:290–295.
150. Roos-Jansåker AM, Renvert H, Lindahl C, Renvert S. Nine- to fourteen-year follow-up of implant treatment. Part III: Factors associated with periimplant lesions. *J Clin Perio- dontol* 2006b; 33:296-301.
151. Rosenberg ES, Cho SC, Elian N, Jalbout ZN, Froum S, Evian CI. A comparison of characteristics of implant failure and survival in periodontally compromised and periodontally healthy patients: A clinical report. *Int J Oral Maxillofac Implants* 2004; 19:873-879.
152. Rutar A, Lang NP, Buser D, Bürgin W, Mombelli A. Retrospective assessment of clinical and microbiological factors affecting periimplant tissue conditions. *Clin Oral Implants Res* 2001;12:189-195.
153. Rocuzzo M, Bonino F, Aglietta M, Dalmaso P. Ten-year results of a three arms prospective cohort study on implants in periodontally compromised patients. Part 2: clinical results. *Clin Oral Implants Res* 2012;23:389-395.
154. Sato S, Kishida M, Ito K. The comparative effect of ultrasonic scalers on titanium surfaces: an in vitro study. *J Periodontol* 2004;75:1269-1273.
155. Schär D, Ramseier CA, Eick S, Arweiler NB, Sculean A, Salvi GE. Anti-infective therapy of peri-implantitis with adjunctive local drug delivery or photodynaic therapy: six-month outcomes of a prospective randomized clinical trial. *Clin Oral Implants Res*. 2012 May 9. doi: 10.1111/j.1600-0501.2012.02494.x

156. Schermer S. Periimplantitis und crestaler Knochenverlust. Die Goldlösung für den Mikrospace. DZW Orale Implantol 2007;1: 37-40.
157. Schou S. Implant treatment in periodontitis-susceptible patients: a systematic review. J Oral Rehabil 2008 Jan;35 Suppl 1:9-22.
158. Schou S, Holmstrup P, Worthington HV, Esposito M. Outcome of implant therapy in patients with previous tooth loss due to periodontitis. Clin Oral Implants Res 2006;17 Suppl 2:104-123.
159. Schwarz F, Bieling K, Sculean A, Herten M, Becker J. Laser und Ultraschall in der Therapie periimplantärer Infektionen – eine Literaturübersicht. Schweiz Monatsschr Zahnmed 2004;114:1228-1235.
160. Schwarz F, Sculean A, Romanos G, Herten M, Horn N, Scherbaum W, Becker J. Influence of different treatment approaches on the removal of early plaque biofilms and the viability of SAOS2 osteoblast grown on titanium implants. Clin Oral Invest 2005;9:111-117.
161. Schwarz F, Bieling K, Bonsmann M, Latz T, Becker J. Nonsurgical treatment of moderate and advanced peri-implantitis lesions: a controlled clinical study. Clin Oral Invest 2006;10:279-288.
162. Schwarz F, Ferrari D, Popovski C, Becker J (2007) Entfernung bakterieller Plaque- Biofilme von strukturierten Titanimplantaten unter Verwendung von Laserwellenlängen im Bereich von 3 µm. In: Schwarz F, Becker J (Hrsg.). Periimplantäre Entzündungen – Ätiologie, Pathogenese, Diagnostik und aktuelle Therapiekonzepte. Quintessenz, 2007, pp. 231-238.
163. Schwarz F, Sahm N, Becker J. Aktuelle Aspekte zur Therapie periimplantärer Entzündungen. Oral Chir Oral Med 2008;59:521-530.

164. Schwarz F, Ferrari D, Popovski K, Hartig B, Becker J. Influence of different air-abrasive powders on cell viability at biologically contaminated titanium dental implants surfaces. *J Biomed Mater Res B Appl Biomater* 2009;88:83-91.
165. Schwarz F, Iglhaut G, Becker J. Quality assessment of reporting of animal studies on pathogenesis and treatment of peri-implant mucositis and peri-implantitis. *J Clin Periodontol* 2012;39 Suppl 12:63-72.
166. Sculean A, Schwarz F, Berakdar M, Romanos GE, Brex M, Willershausen B, Becker J. Non-surgical periodontal treatment with a new ultrasonic device (Vector-ultrasonic system) or hand instruments. *J Clin Periodontol* 2004;31: 428-433.
167. Serino G, Ström C. Peri-implantitis in partially edentulous patients: association with inadequate plaque control. *Clin Oral Implants Res* 2009;20:169-174.
168. Simonis P, Dufour T, Tenenbaum H. Long-term implant survival and success: a 10-16-year follow-up of non-submerged dental implants. *Clin Oral Implants Res* 2010; 21:772-777.
169. Stanford C. Dental implant outcomes may vary in patients with a history of perio- dental disease. *J Evid Based Dent Pract* 2010;10:46-48.
170. Steinebrunner L, Wolfart S, Bößmann K, Kern M. In vitro evaluation of bacterial leakage along the implant-abutment interface of different implant systems. *Int J Oral Maxillofac Implants* 2005;20:875-881.
171. Strietzel FP, Reichart PA, Kale A, Kulkarni M, Wegner B, Kuchler I. Smoking interferes with the prognosis of dental implant treatment: a systematic review and meta-analysis. *J Clin Periodontol* 2007;34: 523-544.
172. Subramani K, Jung RE, Molenberg A, Hämmerle CH. Biofilm on dental implants: a review of the literature. *Int J Oral Maxillofac Implants* 2009;24:616-626.

173. Takasaki AA, Aoki A, Mizutani K, Schwarz F, Sculean A, Wang CY, Koshy G, Romanos G, Ishikawa I, Izumi Y. Application of antimicrobial photodynamic therapy in periodontal and peri-implant diseases. *Periodontol 2000* 2009;51: 109-140.
174. Tonetti MS. Determination of the success and failure of root-form osseointegrated dental implants. *Adv Dent Res* 1999;13:173-180.
175. Verran J, Whitehead K. Factors affecting microbial adhesion to stainless steel and other materials used in medical devices. *Int J Artif Organs* 2005; 28:1138-1145.
176. Von Giese Brookshire F, Nagy WW, Dhuru VB, Ziebert GJ, Chada S. The quality effects of various types of hygiene instrumentation on commercially pure titanium and titanium alloy implant abutments: an in vitro and scanning electron microscope study. *J Prosth Dent* 1997;78:286-294.
177. Weber HP, Cochran DL. The soft tissue response to osseointegrated dental implants. *J Prosthet Dent* 1998;79:79-89.
178. Weyant RJ. Characteristics associated with the loss and periimplant tissue health of endosseous dental implants. *Int J Oral Maxillofac Implants* 1994; 9:95-102.
179. Zablotzky MH, Diedrich DL, Meffert RM. Detoxification of endotoxin contaminated titanium and hydroxyapatite-coated surfaces utilizing various chemotherapeutic and mechanical modalities. *Implant Dent* 1992;1:154-158.
180. Zipprich H, Weigl P, Lange B, Lauer HC. Erfassung, Ursachen und Folgen von Mikrobewegungen am Implantat-Abutment-Interface. *Implantol* 2007;15:31-46.
181. Zitzmann NU, Berglundh T. Definition and prevalence of peri-implant diseases. *J Clin Periodontol* 2008;35:286-291.