

Astra Tech Implant System® – Clinical documentation*

Well documented, consistently reliable and safe

- More than 9,000 patients followed prospectively up to 20 years
- >98% implant survival rate at 5 years of follow-up
- ~0.3 mm bone level reduction at 5 years of follow-up

Four implant design features behind the clinical success

Since 1991, Astra Tech Implant System is based on 4 key features**:

- OsseoSpeed surface since 2004 with 10 years of documented clinical follow-up
- Conical implant-abutment connection, Conical Seal Design
- MicroThread on the implant neck
- Unique Connective Contour, i.e. horizontal offset

Portfolio of implant designs range from short (6 mm)¹⁻¹⁸, narrow (\varnothing 3.0 mm)¹⁹⁻²⁴ and sloped implant neck contour (Profile)²⁵⁻²⁸ to OsseoSpeed EV²⁹⁻³³, all being well documented in the scientific community.

	< 5 years	5-9 years	>10 years
Single tooth	5, 7, 9, 13, 14, 16, 18-21, 25, 26, 29, 30, 34-58	17, 59-61	62, 63
Fixed prosthesis	1, 3, 8, 10, 11, 15, 31, 33, 64-78	79-84	85-93
Overdenture	4, 94-100	101-103	104, 105
Esthetic focus	22, 27, 28, 106-119	109	
Surgical focus	6, 32, 120-142	135, 143-145	
Peri-implantitis focus	146-148		149
Patients evaluation	2, 12, 150-161	162	

Astra Tech Implant System literature sorted per primary indication and scientific focus, and length of prospective follow-up period.

Conclusion

Extensive literature shows safe, consistent and predictable results for Astra Tech Implant System in terms of high implant survival rate and well maintained marginal bone.

* This Scientific Review on Astra Tech Implant System only cites articles based on prospective studies where ≥ 5 patients have been followed for ≥ 1 year with OsseoSpeed implants or ≥ 5 patients have been followed for >5 year with TiOblast implants

** For literature about the specific key features of Astra Tech Implant System, please see www.dentsplysirona.com

References

1. Clelland N, Chaudhry J, Rashid RG, et al. *Int J Oral Maxillofac Implants* 2016;31(5):1135-41.
2. Gates WD, 3rd, Cooper LF, Sanders AE, et al. *Clin Oral Implants Res* 2014;25(2):207-13.
3. Gulje F, Abrahamsson I, Chen S, et al. *Clin Oral Implants Res* 2013;24(12):1325-31.
4. Gulje F, Raghoebar GM, Ter Meulen JW, et al. *Clin Implant Dent Relat Res* 2012;14 Suppl 1(Supplement 1):e59-66.
5. Gulje FL, Raghoebar GM, Erkens WA, et al. *Int J Oral Maxillofac Implants* 2016;31(3):672-5.
6. Gulje FL, Raghoebar GM, Vissink A, et al. *Eur J Oral Implantol* 2014;7(3):247-55.
7. Gulje FL, Raghoebar GM, Vissink A, et al. *Clin Implant Dent Relat Res* 2015;17 Suppl 2:e465-71.
8. Han J, Zhang X, Tang Z, et al. *Clin Oral Implants Res* 2016;27(4):452-7.
9. Malmstrom H, Gupta B, Ghanem A, et al. *Clin Oral Implants Res* 2016;27(9):1093-8.
10. Pieri F, Aldini NN, Fini M, et al. *Int J Prosthodont* 2012;25(3):279-89.
11. Tabrizi R, Arabion H, Alibadi E, et al. *Br J Oral Maxillofac Surg* 2016;54(7):731-5.
12. Thoma DS, Haas R, Tutak M, et al. *J Clin Periodontol* 2015;42(1):72-80.
13. Han J, Tang Z, Zhang X, et al. *Clin Implant Dent Relat Res* 2018;20(1):34-42.
14. Schincaglia GP, Thoma DS, Haas R, et al. *J Clin Periodontol* 2015;42(11):1042-51.
15. Zadeh HH, Gulje F, Palmer PJ, et al. *Clin Oral Implants Res* 2018;E-pub Jul 12, doi:10.1111/cir.13341.
16. Hadzik J, Krawiec M, Slawiecki K, et al. *Biomed Res Int* 2018;2018:4246874.
17. Thoma DS, Haas R, Sporniak-Tutak K, et al. *J Clin Periodontol* 2018;45(12):1465-74.
18. Hadzik J, Krawiec M, Kubasiewicz-Ross P, et al. *Med Sci Monit* 2018;24:5645-52.
19. Galindo-Moreno P, Nilsson P, King P, et al. *Clin Oral Implants Res* 2012;23(5):609-16.
20. King P, Maiorana C, Luthardt RG, et al. *Int J Prosthodont* 2016;29(2):147-53.
21. Maiorana C, King P, Quaas S, et al. *Clin Oral Implants Res* 2015;26(1):77-82.
22. Pieri F, Siroli L, Forlivesi C, et al. *Int J Periodontics Restorative Dent* 2014;34(6):825-32.
23. Galindo-Moreno P, Nilsson P, King P, et al. *Clin Oral Implants Res* 2017;28(12):1584-91.
24. Galindo-Moreno P, Padial-Molina M, Nilsson P, et al. *Clin Oral Implants Res* 2017;28(6):704-12.
25. Lee PK, Siu AS. *Int J Oral Maxillofac Implants* 2016;31(6):1423-28.
26. Noelken R, Donati M, Fiorellini J, et al. *Clin Oral Implants Res* 2014;25(1):3-9.
27. Noelken R, Oberhansl F, Kunkel M, et al. *Clin Oral Implants Res* 2016;27(6):744-9.
28. Schiegnitz E, Noelken R, Moergel M, et al. *Clin Oral Implants Res* 2017;28(6):721-26.
29. Stanford CM, Barwacz C, Raes S, et al. *Int J Oral Maxillofac Implants* 2016;31(4):906-15.
30. Norton MR. *Int J Oral Maxillofac Implants* 2017;32(4):849-57.
31. Toia M, Stochero M, Becktor JP, et al. *Clin Implant Dent Relat Res* 2019;E-pub Jan 29, doi:10.1111/cid.12717.
32. Levin BP, Chu SJ. *Int J Periodontics Restorative Dent* 2018;38(5):719-27.
33. Borges T, Leitao B, Pereira M, et al. *Clin Oral Implants Res* 2018;29(9):907-14.
34. Barewal RM, Stanford C, Weesner TC. *Int J Oral Maxillofac Implants* 2012;27(4):945-56.
35. Berberi AN, Noujeim ZN, Kanj WH, et al. *J Contemp Dent Pract* 2014;15(2):202-8.
36. Ferrari M, Tricarico MG, Cagidiaco MC, et al. *Clin Implant Dent Relat Res* 2016;18(6):1134-41.
37. Ghovali R, Alikhasi M, Siadat M-R, et al. *J Dent (Tehran)* 2013;10(2):155-63.
38. Hosseini M, Worsaae N, Schiodt M, et al. *Eur J Oral Implantol* 2011;4(4):347-61.
39. Hosseini M, Worsaae N, Schiodt M, et al. *Clin Oral Implants Res* 2013;24(10):1078-87.
40. Koutouzis T, Neiva R, Lipton D, et al. *Int J Oral Maxillofac Implants* 2015;30(4):900-8.
41. Kutan E, Bolukbasi N, Yildirim-Ondur E, et al. *Clin Implant Dent Relat Res* 2015;17 Suppl 2:e364-75.
42. Lee DW, Lee DW, Park KH, et al. *J Prosthet Dent* 2014;112(3):501-7.
43. Marcelis K, Vercruyssen M, Naert I, et al. *Clin Oral Implants Res* 2012;23(8):999-1003.
44. Palmer RM, Howe LC, Palmer PJ, et al. *Clin Oral Implants Res* 2012;23(1):35-40.
45. Sanz M, Cecchinato D, Ferrus J, et al. *Clin Oral Implants Res* 2014;25(3):321-27.
46. Schepke U, Meijer HJ, Vermeulen KM, et al. *Clin Implant Dent Relat Res* 2016;18(5):984-92.
47. Tabrizi R, Pourdanhesh F, Zare S, et al. *J Oral Maxillofac Surg* 2013;71(2):272-7.
48. Thoma DS, Brandenberg F, Fehmer V, et al. *Clin Implant Dent Relat Res* 2016;18(3):462-72.
49. Vera C, De Kok IJ, Chen W, et al. *Int J Oral Maxillofac Implants* 2012;27(5):1249-57.
50. Guncu MB, Cakan U, Aktas G, et al. *Clin Oral Investig* 2016;20(9):2467-73.
51. Lops D, Mosca D, Muller A, et al. *Minerva Stomatol* 2011;60(9):403-15.
52. Simmons DE, Maney P, Teitelbaum AG, et al. *Int J Implant Dent* 2017;3(1):16.
53. Schepke U, Lohbauer U, Meijer HJ, et al. *Int J Prosthodont* 2018;31(3):208-10.
54. Ferrari M, Cagidiaco MC, Garcia-Godoy F, et al. *Am J Dent* 2015;28(2):85-9.
55. Basler T, Naenni N, Schneider D, et al. *Clin Oral Implants Res* 2018;29(5):499-507.
56. Thoma DS, Sailer I, Muhlemann S, et al. *Clin Implant Dent Relat Res* 2018;E-pub Oct 17, doi: 10.1111/cid.12674.
57. Eisner B, Naenni N, Husler J, et al. *Int J Periodontics Restorative Dent* 2018;38(5):645-52.
58. Barwacz CA, Stanford CM, Diehl UA, et al. *Int J Oral Maxillofac Implants* 2018;33(5):1126-35.
59. Berberi AN, Sabbagh JM, Aboushelib MN, et al. *Front Physiol* 2014;5:29.
60. Lops D, Bressan E, Chiapasco M, et al. *Int J Oral Maxillofac Implants* 2013;28(1):281-7.
61. Veltri M, Ekestubbe A, Abrahamsson I, et al. *Clin Oral Implants Res* 2016;27(8):956-63.
62. Raes S, Eghbali A, Chappuis V, et al. *Clin Implant Dent Relat Res* 2018;E-pub Apr 19, doi:10.1111/cid.12613.
63. Raes S, Cosyn J, Noyelle A, et al. *Int J Periodontics Restorative Dent* 2018;38(3):337-45.
64. Balleri P, Ferrari M, Veltri M. *Clin Implant Dent Relat Res* 2010;12(4):324-30.
65. Barbier L, Abeloos J, De Clercq C, et al. *Clin Oral Investig* 2012;16(4):1061-70.
66. Collaert B, Wijnen L, De Bruyn H. *Clin Oral Implants Res* 2011;22(10):1111-16.
67. D'Haese J, Vervaeke S, Verbanck N, et al. *Int J Oral Maxillofac Implants* 2013;28(1):205-15.
68. Ebler S, Ioannidis A, Jung RE, et al. *Clin Oral Implants Res* 2016;27(9):1169-77.
69. Esquivel-Upshaw JF, Clark AE, Shuster JJ, et al. *J Prosthodont* 2014;23(2):73-82.
70. Esquivel-Upshaw JF, Mehler A, Clark AE, et al. *J Dent* 2014;42(10):1335-42.
71. Kim JJ, Lee DW, Kim CK, et al. *Clin Oral Implants Res* 2010;21(4):439-44.
72. Lajae A, Ozkan YK, Ozkan Y, et al. *Int J Oral Maxillofac Implants* 2012;27(1):162-72.
73. Stanford CM, Wagner W, Rodriguez YBR, et al. *Int J Oral Maxillofac Implants* 2010;25(2):367-73.
74. Temmerman A, Rasmussen L, Kubler A, et al. *Clin Oral Implants Res* 2017;28(1):95-102.
75. Vervaeke S, Collaert B, De Bruyn H. *Int J Oral Maxillofac Implants* 2013;28(5):1352-7.
76. Zhou J, Huang Q, Wang X, et al. *J Clin Periodontol* 2016;43(3):298-304.
77. Arora H, Khzam N, Roberts D, et al. *Clin Implant Dent Relat Res* 2017;19(4):694-702.
78. Bernard L, Vercruyssen M, Duyck J, et al. *J Prosthet Dent* 2019;E-pub Feb 4, doi:10.1016/j.jprostdent.2018.09.004.
79. Mertens C, Steveling HG. *Clin Oral Implants Res* 2011;22(5):464-72.
80. Vervaeke S, Collaert B, Cosyn J, et al. *Clin Implant Dent Relat Res* 2016;18(1):30-9.
81. Mertens C, Steveling HG. *Clin Oral Implants Res* 2011;22(12):1354-60.
82. Schliephake H, Rodiger M, Phillips K, et al. *J Clin Periodontol* 2012;39(2):188-95.

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83. Toljanic JA, Ekstrand K, Baer RA, et al. Int J Oral Maxillofac Implants 2016;31(5):1164-70.
84. Noelken R, Moergel M, Kunkel M, et al. Clin Oral Implants Res 2018;29(3):320-27.
85. Mertens C, Meyer-Baumer A, Kappel H, et al. Int J Oral Maxillofac Implants 2012;27(6):1501-8.
86. Mertens C, Steveling HG, Stucke K, et al. Clin Implant Dent Relat Res 2012;14(6):816-27.
87. Rasmusson L, Roos J, Bystedt H. Clin Implant Dent Relat Res 2005;7(1):36-42.
88. Raval N, Dahlgren S, Teiwik A, et al. Clin Oral Implants Res 2013;24(10):1144-51.
89. Van Assche N, Pittayapat P, Jacobs R, et al. Eur J Oral Implantol 2011;4(2):103-16.
90. Jacobs R, Pittayapat P, van Steenberghe D, et al. J Clin Periodontol 2010;37(12):1119-27.
91. Cecchinato D, Parpaila A, Lindhe J. Clin Oral Implants Res 2014;25(7):791-6.
92. Donati M, Ekestubbe A, Lindhe J, et al. Clin Oral Implants Res 2018;E-pub Mar 18, doi: 10.1111/cir.13145.
93. Windael S, Vervaeke S, Wijnen L, et al. Clin Implant Dent Relat Res 2018;20(4):515-21.
94. Bressan E, Tomasi C, Stellini E, et al. Clin Oral Implants Res 2012;23(7):814-9.
95. Gokcen-Rohlig B, Meric U, Keskin H. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 2010;109(4):e1-7.
96. Mumcu E, Bilhan H, Geckili O. Indian J Dent Res 2012;23(4):514-8.
97. Roe P, Kan JY, Rungcharassaeng K, et al. Int J Oral Maxillofac Implants 2011;26(6):1296-302.
98. Schincaglia GP, Rubin S, Thacker S, et al. Int J Oral Maxillofac Implants 2016;31(2):448-58.
99. Slot W, Raghoobar GM, Vissink A, et al. J Clin Periodontol 2013;40(3):303-10.
100. Slot W, Raghoobar GM, Vissink A, et al. Clin Implant Dent Relat Res 2014;16(1):51-61.
101. Boven GC, Meijer HJ, Slot W, et al. J Craniomaxillofac Surg 2015;43(9):1758-62.
102. Slot W, Raghoobar GM, Cune MS, et al. J Clin Periodontol 2016;43(12):1180-87.
103. Boven GC, Slot JWA, Raghoobar GM, et al. J Oral Rehabil 2017;44(12):988-95.
104. Lehmann KM, Kammerer PW, Karbach J, et al. Int J Oral Maxillofac Implants 2013;28(4):1126-31.
105. Vroom MG, Sipos P, de Lange GL, et al. Clin Oral Implants Res 2009;20(11):1231-9.
106. Barwacz CA, Stanford CM, Diehl UA, et al. Clin Oral Implants Res 2016;27(6):707-15.
107. Borges T, Lima T, Carvalho A, et al. Clin Oral Implants Res 2014;25(11):1222-27.
108. Cecchinato D, Lops D, Salvi GE, et al. Clin Oral Implants Res 2015;26(1):20-7.
109. Cooper LF, Reside G, Raes F, et al. Int J Periodontics Restorative Dent 2014;34(4):477-86.
110. Levin BP, Wilk BL. Compend Contin Educ Dent 2013;34(5):352-61.
111. Lops D, Bressan E, Parpaila A, et al. Clin Oral Implants Res 2015;26(12):1436-42.
112. Lops D, Chiapasco M, Rossi A, et al. Clin Oral Implants Res 2008;19(11):1135-40.
113. Noelken R, Neffe BA, Kunkel M, et al. Clin Oral Implants Res 2014;25(2):214-20.
114. Raes F, Cosyn J, Crommelinck E, et al. J Clin Periodontol 2011;38(4):385-94.
115. Raes S, Rocci A, Raes F, et al. Clin Oral Implants Res 2015;26(9):1086-90.
116. Tsuda H, Rungcharassaeng K, Kan JY, et al. Int J Oral Maxillofac Implants 2011;26(2):427-36.
117. Arora H, Ivanovski S. Clin Oral Implants Res 2017;28(10):1188-94.
118. Cooper LF, Reside G, Stanford C, et al. Int J Oral Maxillofac Implants 2015;30(3):622-32.
119. Lops D, Parpaila A, Paniz G, et al. Int J Periodontics Restorative Dent 2017;37(5):657-65.
120. Bashutski JD, Wang HL, Rudek I, et al. J Periodontol 2013;84(12):1747-54.
121. Cooper LF, Raes F, Reside GJ, et al. Int J Oral Maxillofac Implants 2010;25(6):1222-32.
122. De Bruyn H, Raes F, Cooper LF, et al. Clin Oral Implants Res 2013;24(2):217-23.
123. Donati M, La Scala V, Billi M, et al. Clin Oral Implants Res 2008;19(8):740-8.
124. Esquivel-Upshaw J, Mehler A, Clark A, et al. Clin Oral Implants Res 2015;26(12):1390-6.
125. Kahnberg KE, Wallstrom M, Rasmusson L. Clin Implant Dent Relat Res 2011;13(3):231-7.
126. Koutouzis T, Koutouzis G, Tomasi C, et al. J Periodontol 2011;82(11):1556-62.
127. Lyngstadaas SP, Verket A, Pinholt EM, et al. Clin Implant Dent Relat Res 2015;17 Suppl 2:e594-600.
128. Mertens C, Steveling HG, Seeberger R, et al. Clin Implant Dent Relat Res 2013;15(5):673-83.
129. Oxby G, Oxby F, Oxby J, et al. Clin Implant Dent Relat Res 2015;17(5):898-907.
130. Pieri F, Aldini NN, Fini M, et al. Clin Implant Dent Relat Res 2012;14 Suppl 1(Suppl 1):e67-82.
131. Piero B, Mario V, Niccolo N, et al. Clin Implant Dent Relat Res 2012;14(5):682-9.
132. Raes F, Cosyn J, De Bruyn H. Clin Implant Dent Relat Res 2013;15(6):819-35.
133. Raes F, Renckens L, Aps J, et al. Clin Implant Dent Relat Res 2013;15(5):661-72.
134. Thor A, Ekstrand K, Baer RA, et al. Int J Oral Maxillofac Implants 2014;29(3):642-9.
135. Toljanic JA, Baer RA, Ekstrand K, et al. Int J Oral Maxillofac Implants 2009;24(3):518-26.
136. Vercruyssen M, van de Wiele G, Teughels W, et al. J Clin Periodontol 2014;41(12):1154-60.
137. Yoon WJ, Jeong Ki, You JS, et al. J Korean Assoc Oral Maxillofac Surg 2014;40(1):17-20.
138. Pohl V, Thoma DS, Sporniak-Tutak K, et al. J Clin Periodontol 2017;44(4):438-45.
139. Merheb J, Vercruyssen M, Coucke W, et al. Clin Oral Implants Res 2017;28(1):103-08.
140. Mordenfeld A, Aludden H, Starch-Jensen T. Clin Implant Dent Relat Res 2017;19(5):884-94.
141. Temmerman A, Keestra JA, Coucke W, et al. J Clin Periodontol 2015;42(3):311-8.
142. Uribarri A, Bilbao E, Marichalar-Mendia X, et al. Clin Implant Dent Relat Res 2017;19(2):268-79.
143. Cooper LF, Reside GJ, Raes F, et al. Int J Oral Maxillofac Implants 2014;29(3):709-17.
144. Donati M, La Scala V, Di Raimondo R, et al. Clin Implant Dent Relat Res 2015;17(3):425-34.
145. Temmerman A, Rasmusson L, Kubler A, et al. J Dent Res 2018;E-pub Sep 11, doi:10.1177/002202034518798804.
146. Aguirre-Zorzano LA, Vallejo-Aisa FJ, Estefania-Fresco R. Med Oral Patol Oral Cir Bucal 2013;18(5):e786-92.
147. Brandenberg FD, Sailer I, Fehmer V, et al. Clin Oral Implants Res 2017;28(4):406-13.
148. Carcuac O, Derkx J, Charalampakis G, et al. J Dent Res 2016;95(1):50-7.
149. Renvert S, Lindahl C, Rutger Persson G. J Clin Periodontol 2012;39(12):1191-7.
150. Cakir O, Kazancioglu HO, Celik G, et al. J Prosthodont 2014;23(5):390-6.
151. De Kok IJ, Chang KH, Lu TS, et al. Int J Oral Maxillofac Implants 2011;26(2):415-26.
152. Emami E, Cerutti-Kopplin D, Menassa M, et al. J Dent 2016;50:30-6.
153. Limmer B, Sanders AE, Reside G, et al. J Prosthodont 2014;23(4):267-75.
154. Mertens C, de San Jose Gonzalez J, Freudlsperger C, et al. J Craniomaxillofac Surg 2016;44(11):1812-18.
155. Raes F, Cooper LF, Tarrida LG, et al. Clin Oral Implants Res 2012;23(5):602-8.
156. Rismanchian M, Fazel A, Rakhshan V, et al. Clin Oral Implants Res 2011;22(12):1440-5.
157. Schepke U, Meijer HJ, Kerdijk W, et al. Clin Implant Dent Relat Res 2017;19(1):74-84.
158. Van Lierde KM, Corthals P, Browaeys H, et al. J Oral Rehabil 2011;38(3):170-5.
159. Erkapers M, Ekstrand K, Baer RA, et al. Int J Oral Maxillofac Implants 2011;26(2):356-64.
160. Ettl T, Weindler J, Gosau M, et al. J Craniomaxillofac Surg 2016;44(9):1453-62.
161. Packer M, Nikitin V, Coward T, et al. Gerodontology 2009;26(1):1-8.
162. Raes S, Raes F, Cooper L, et al. Clin Oral Implants Res 2017;28(6):662-67.

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