

SUPPLEMENTARY MATERIAL

Dental implant-related journals included in the manual search;

Figure S1. Forest plot for the event 'implant failure', global results;

Figure S2. Forest plot for the event 'implant failure', when only results from RCT studies were pooled together;

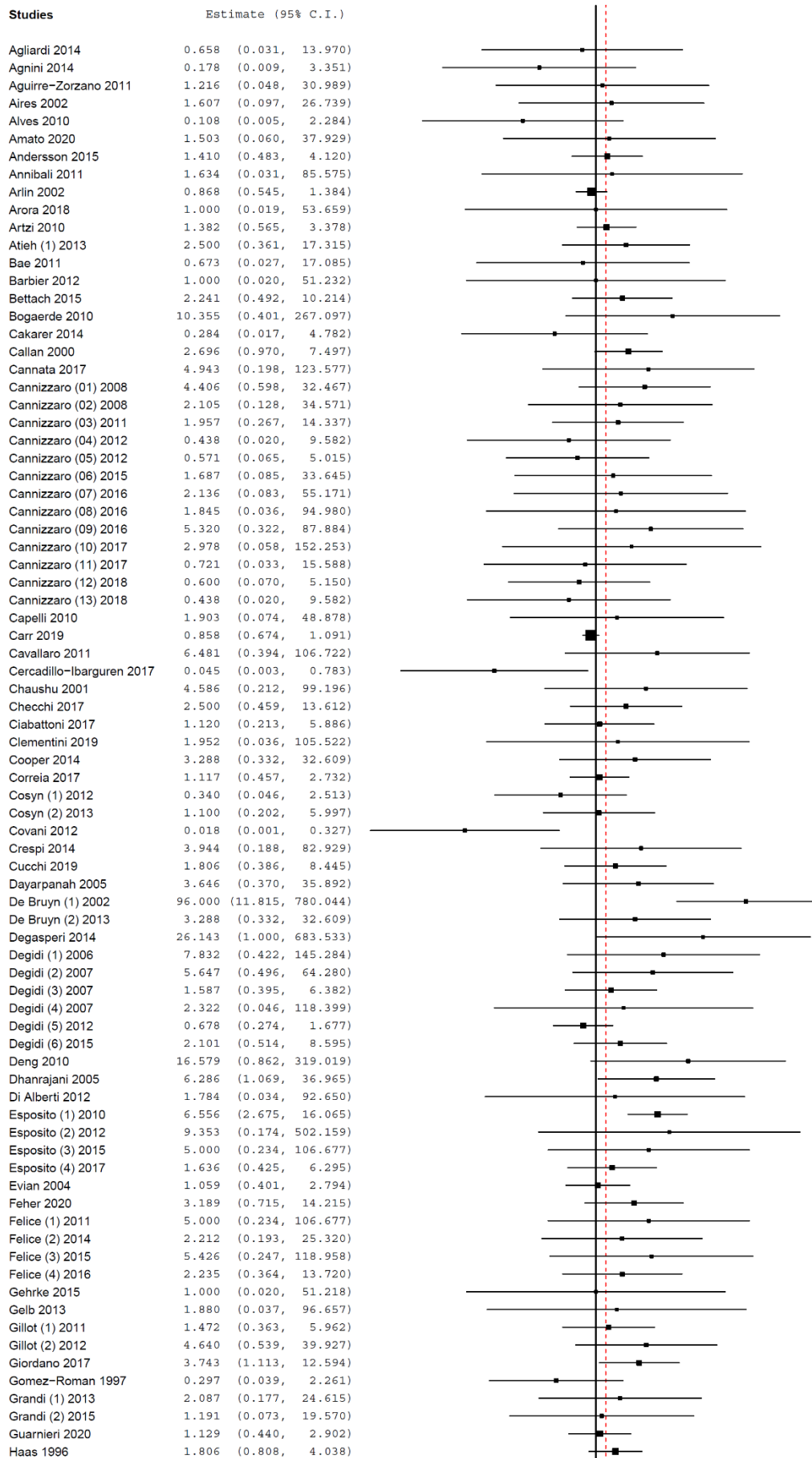
Figure S3. Forest plot for the event 'implant failure', when only results from prospective non-RCT studies were pooled together;

Table S1. Detailed data of the included studies;

Table S2. Quality assessment of the included studies, according to the National Institutes of Health (NIH).

Dental implant-related journals included in the manual search

Clinical Implant Dentistry and Related Research, Clinical Oral Implants Research, European Journal of Oral Implantology, Implant Dentistry, International Journal of Implant Dentistry, International Journal of Oral and Maxillofacial Implants, International Journal of Oral Implantology, International Journal of Prosthodontics, Journal of Clinical Periodontology, Journal of Oral Implantology, Journal of Periodontology, Journal of Prosthetic Dentistry, Journal of Prosthodontics, Journal of Prosthodontic Research.



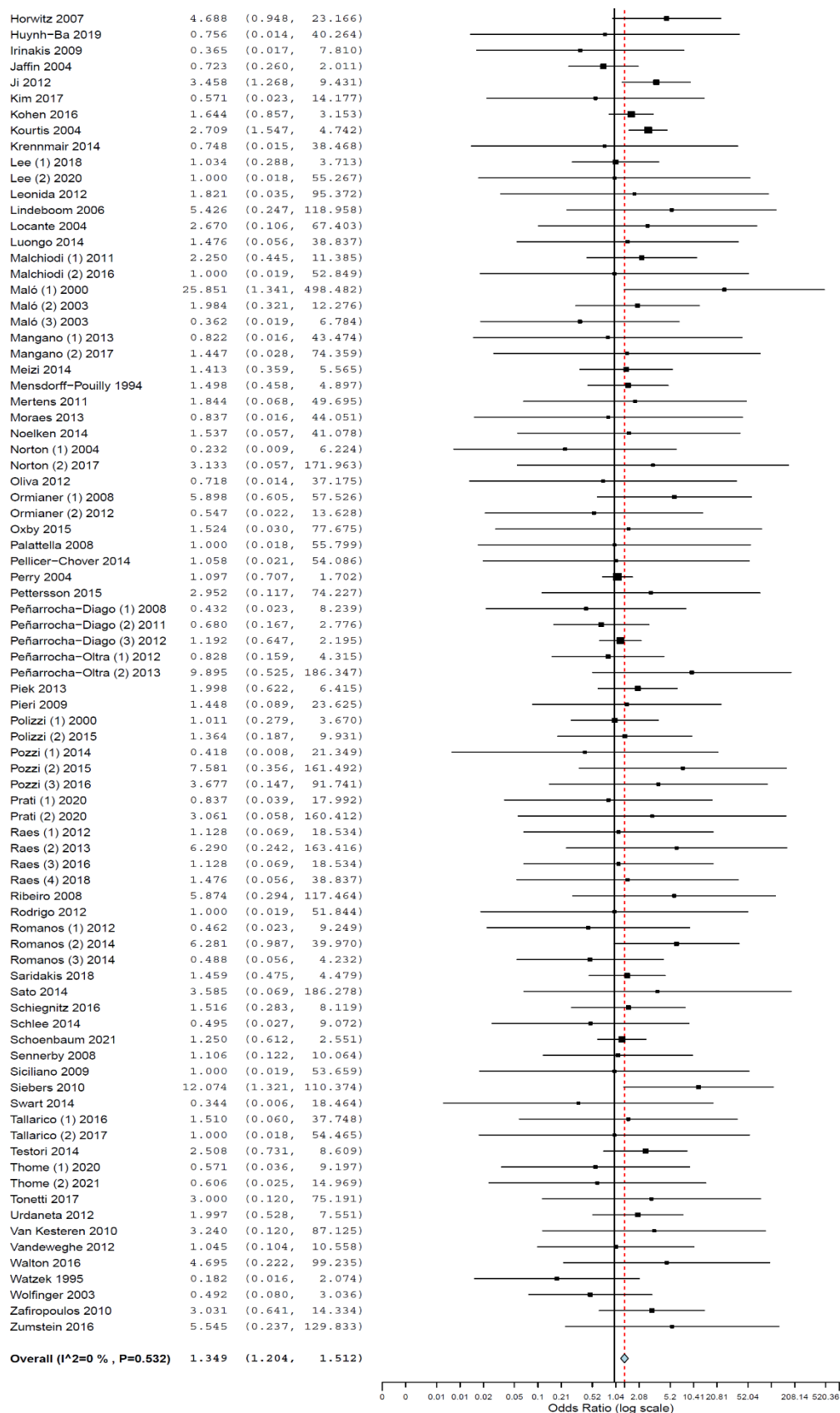


Figure S1. Forest plot for the event 'implant failure', global results.

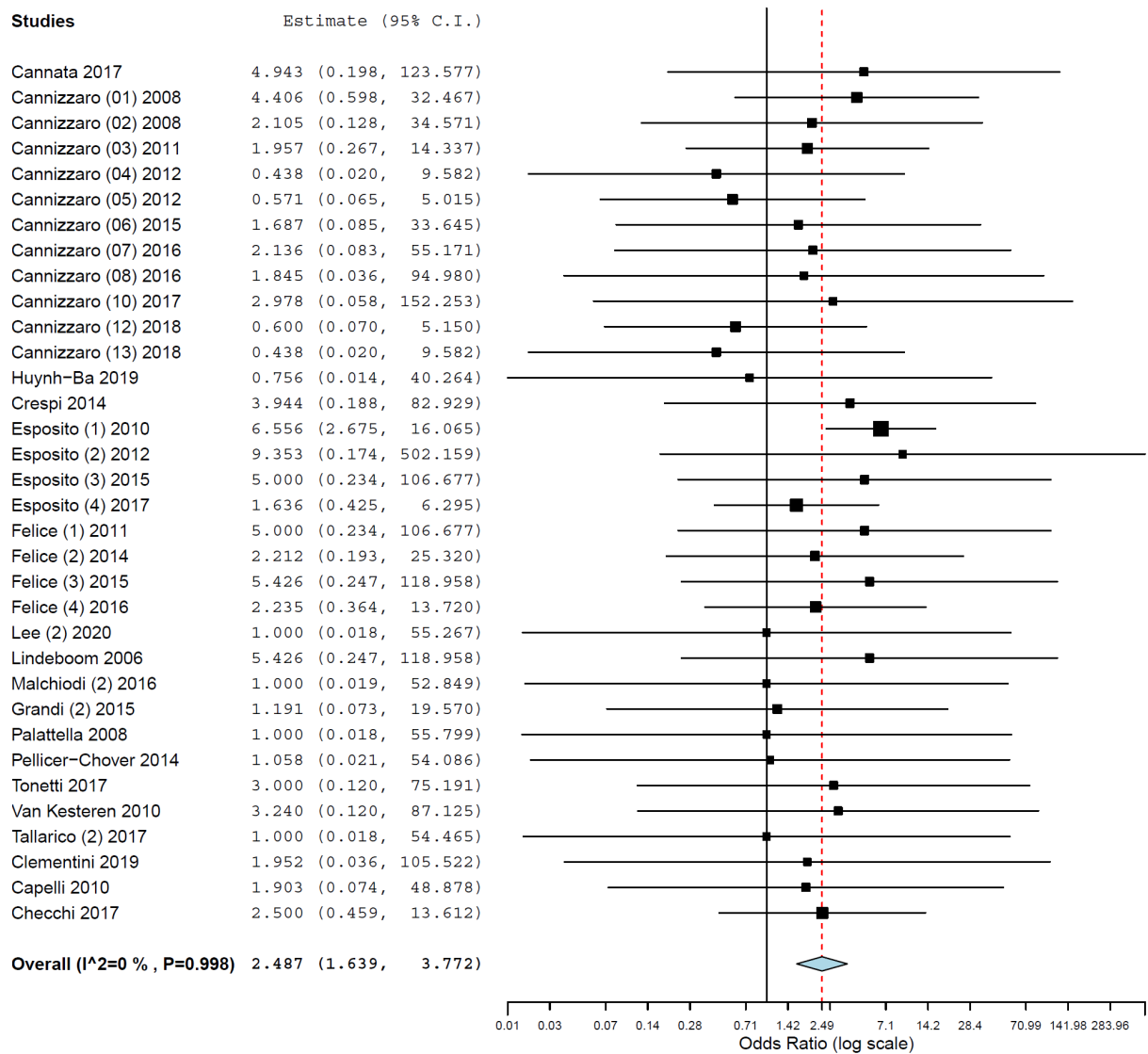


Figure S2. Forest plot for the event ‘implant failure’, when only results from RCT studies were pooled together.

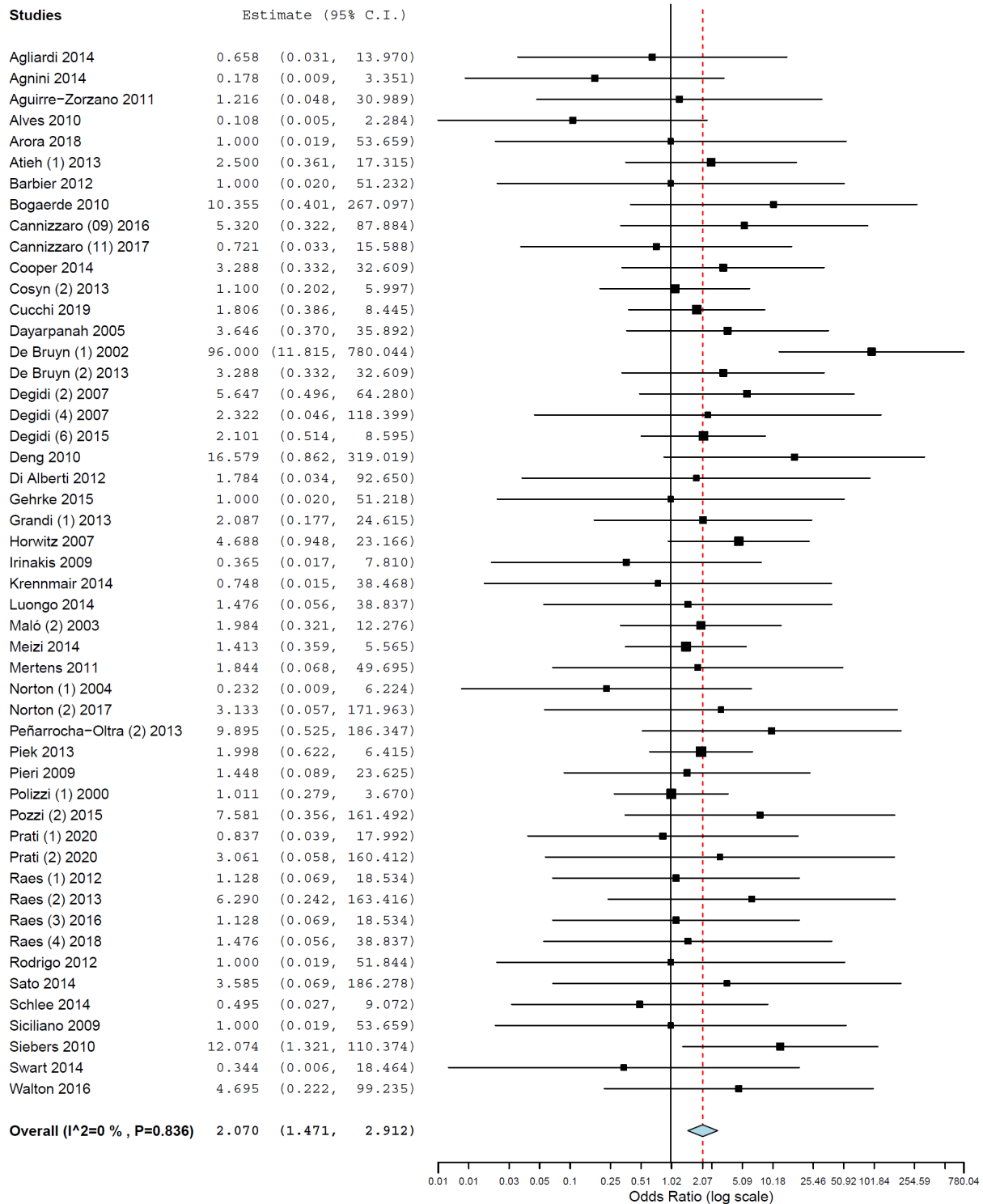


Figure S3. Forest plot for the event 'implant failure', when only results from prospective non-RCT studies were pooled together.

Table S1. Detailed data of the included studies.

Study	Year	Study design	Country / Setting	Patients (male/female) (n)	Patients' Age Range (mean) (years)	Prosthetic loading	Implants location	Implant used	Were there smokers in the group of patients? *
Agliardi	2014	CCT (unicenter)	Italy / Private practice	32 (15/17)	44-68 (58)	Immediate	Mx	MK IV and NobelSpeedy Groovy (Nobel Biocare, Göteborg, Sweden)	11 light smokers
Agnini	2014	CCT (unicenter)	Italy / University	30 (10/20)	NM (64.4)	Immediate	Mx, Md	Tapered Screw-Vent and Spline implants (Zimmer Dental Inc., Carlsbad, USA)	7 light and heavy smokers
Aguirre-Zorzano	2011	CCT (unicenter)	Spain / University	57 (19/37)	26-78 (48.5)	Immediate	Mx, Md	Osseospeed (Astra Tech Dental, Mölndal, Sweden)	NM
Aires	2002	RA (unicenter)	USA / NM	7 (NM)	NM	Immediate	Mx, Md	NM	NM
Alves	2010	CCT (unicenter)	Portugal / Private practice	23 (12/11)	NM	Immediate, delayed	Mx, Md	Several (Straumann, Nobel Biocare, Biomet 3i, Lifecore)	4 smokers
Amato	2020	RA (multicenter)	Italy / Private practice	55 (17/38)	30-86 (63)	Immediate	Mx, Md	T3 (Zimmer Biomet, Warsaw, USA)	16 smokers
Andersson	2015	RA (multicenter)	Sweden / Private practice	55 (27/28)	NM	Early (1-3 d)	Mx, Md	Bimodal and Proactive (Neoss Ltd, Harrogate, UK)	NM
Annibali	2011	RA (unicenter)	Italy / University	47 (19/18)	20-62 (40)	Mean 4 mo	Mx, Md	Nobel Replace TiUnite (Nobel Biocare, Göteborg, Sweden), Pilot ZirTi (Sweden & Martina, Due Carrare, Italy)	Only light smokers, but exact number not informed
Arlin	2002	RA (unicenter)	Canada / Private practice	961 (NM)	15-70 (51)	NM	Mx, Md	Several (Sulzer Dental, Nobel Biocare, Implant Innovations, Lifecore Biomedical, Straumann)	Yes, but exact number not informed
Arora	2018	PS (unicenter)	Australia / Private practice	30 (13/17)	26-77 (52)	Delayed (3-4 mo)	Mx	NM (Straumann, Basel, Switzerland)	1 light smoker
Artzi	2010	RA (unicenter)	Israel / University	54 (23/31)	34-81 (57.5)	Immediate	Mx, Md	DFI, ITO, and SPI (Alpha-Bio Tec, Petach Tikva, Israel)	21 heavy smokers
Atieh	2013	CCT (unicenter)	New Zealand / University	24 (9/15)	NM (52)	Immediate	Md	NM (Max Southern Implants, Irene, South Africa)	No
Bae	2011	RA (multicenter)	South Korea / Private practice + University	92 (41/51)	21-71 (42)	Delayed (3-7 mo)	Mx, Md	Seven (MIS Implants Technologies Ltd., Tel Aviv, Israel)	NM
Barbier	2012	CCT (unicenter)	Belgium / University	20 (11/9)	46-87 (61)	Immediate	Mx	Osseospeed (AstraTech AB, Mölndal, Sweden)	4 smokers
Bettach	2015	RA (unicenter)	France / Private practice	149 (79/70)	20-80 (51.8)	Immediate, delayed	Mx, Md	ID ALL (Implant Diffusion International)	Yes, but exact number not informed
Bogaerde	2010	CCT (multicenter)	Italy / Private practice	21 (9/12)	32-79 (60)	Within 7 days	Mx, Md	Bimodal (Neoss Ltd., Harrogate, UK)	Yes, but exact number not informed
Cakarer	2014	RA (unicenter)	Turkey / University	274 (NM)	19-84 (50)	Delayed (2-3 mo)	Mx, Md	Several (Astra Tech, Straumann, SwissPlus)	Yes, but exact number not informed
Callan	2000	RA (multicenter)	USA / Private practice	663 (269/394)	16-90 (55.3)	Delayed (3-6 mo)	Mx, Md	NM	175 smokers

Cannata	2017	RCT (multi-center)	Italy, Lebanon / Private practice	90 (43/47)	23-79 (51)	Delayed (3 mo)	Mx, Md	JDEvolution and JDIcon (J Dental Care, Modena, Italy)	17 light smokers 10 heavy smokers
Cannizzaro	2008	RCT (unicenter)	Italy / Private practice	30 (15/15)	42-75 (59)	Immediate, early (2 mo)	Mx	Tapered SwissPlus (Zimmer Dental, Carlsbad, USA)	8 light smokers 7 heavy smokers
Cannizzaro	2008	RCT (unicenter)	Italy / Private practice	60 (25/35)	36-80 (61)	Immediate, early (6 wk)	Md	Tapered SwissPlus (Zimmer Dental, Carlsbad, USA)	9 light smokers 21 heavy smokers
Cannizzaro	2011	RCT (unicenter)	Italy / Private practice	40 (20/20)	22-65 (44.5)	Immediate	Mx, Md	Tapered SwissPlus (Zimmer Dental, Carlsbad, USA)	12 light smokers 8 heavy smokers
Cannizzaro	2012	RCT (unicenter)	Italy / Private practice	30 (15/15)	18-57 (35)	Immediate, delayed (6 wk)	Mx, Md	NanoTite (Biomet 3i, Palm Beach, USA)	9 light smokers 3 heavy smokers
Cannizzaro	2012	RCT (unicenter)	Italy / Private practice	50 (24/26)	18-71 (38.8)	Immediate	Mx, Md	NanoTite (Biomet 3i, Palm Beach Gardens, USA)	12 light smokers 4 heavy smokers
Cannizzaro	2015	RCT (unicenter)	Italy / Private practice	60 (31/29)	38-80 (59)	Immediate	Mx, Md	Supershort and NT NanoTite (Biomet 3i, Palm Beach Gardens, USA)	7 light smokers 4 heavy smokers
Cannizzaro	2016	RCT (unicenter)	Italy / Private practice	50 (25/25)	19-62 (40)	Immediate	Mx, Md	Syra and Syra SL (Sweden & Martina, Due Carrare, Italy)	11 light smokers 6 heavy smokers
Cannizzaro	2016	RCT (unicenter)	Italy / Private practice	40 (21/19)	33-78 (56)	Immediate	Mx, Md	Prama PF tapered (Sweden & Martina, Due Carrare, Italy)	12 light smokers 4 heavy smokers
Cannizzaro	2016	PS (unicenter)	Italy / Private practice	80 (40/40)	29-85 (53.2)	Immediate	Md	Tapered NT NanoTite (Biomet 3i, Palm Beach Gardens, USA)	18 light smokers 16 heavy smokers
Cannizzaro	2017	RCT (multi-center)	Italy / Private practice	60 (29/31)	37-83 (59)	Immediate	Md	NT Full Osseotite (Zimmer Biomet, Palm Beach Gardens, USA), ExFeel (MegaGen Implant, Gyeongbuk, South Korea)	11 light smokers 5 heavy smokers
Cannizzaro	2017	PS (unicenter)	Italy / Private practice	40 (18/22)	NM (59)	Immediate	Mx, Md	Syra and Syra SL (Sweden & Martina, Due Carrare, Italy)	13 light smokers 4 heavy smokers
Cannizzaro	2018	RCT (multi-center)	Italy / Private practice	48 (28/20)	36-78 (58)	Immediate	Mx, Md	Syra and Syra SL (Sweden & Martina, Due Carrare, Italy)	13 light smokers 4 heavy smokers
Cannizzaro	2018	RCT (unicenter)	Italy / Private practice	30 (15/15)	18-57 (35)	Immediate, delayed (6 wk)	Mx, Md	NanoTite (Biomet 3i, Palm Beach Gardens, USA)	9 light smokers 3 heavy smokers
Capelli	2010	RCT (multi-center)	Italy / Private practice	52 (23/29)	27-74 (51)	Immediate, early (2 mo)	Mx, Md	Full Osseotite Tapered (Zimmer Biomet, Palm Beach Gardens, USA)	12 light smokers 1 heavy smokers
Carr	2019	RA (unicenter)	USA / Non-profit organization	2798 (NM)	>18	Immediate, delayed	Mx, Md	NM	Yes, but exact number not informed
Cavallaro	2011	RA (unicenter)	USA / Private practice	75 (33/42)	28-84 (61.8)	Delayed (6-8 wk)	Mx, Md	NM (Implant Direct LLC, Calabasas, USA)	18 smokers
Cercadillo-Ibarguren	2017	RA (unicenter)	Spain / Private practice	88 (40/48)	40-84 (62.4)	Immediate, delayed	Mx, Md	Replace Select Tapered TiUnite (Nobel Biocare, Göteborg, Sweden)	2 light smokers 26 heavy smokers
Chausu	2001	RA (unicenter)	Israel / Private practice	26 (6/20)	18-70 (44)	Immediate	Mx, Md	Steri-Oss (Steri-Oss Company, Yorba Linda, USA), NM (Alpha Bio, Petah-Tikva, Israel)	No

Checchi	2017	RCT (multi-center)	Italy / Private practice + University	100 (51/49)	NM (53)	Delayed (4 mo)	Mx, Md	Rescue (MegaGen Implant, Gyeongbuk, South Korea)	17 light smokers 7 heavy smokers
Ciabattoni	2017	RA (multi-center)	Italy / Private practice	32 (9/23)	44-73 (59.5)	Immediate	Mx, Md	Mk III TiUnite, NobelActive, Speedy Groovy, Nobel Replace (Nobel Biocare, Göteborg, Sweden)	Light smokers, but the exact number was not informed
Clementini	2019	RCT (multi-center)	Italy / University	30 (14/16)	NM (52)	Not loaded	Mx, Md	TTi WINSIX (Biosafin, Ancona, Italy)	10 light smokers
Cooper	2014	CCT (multi-center)	USA, Spain, Germany, Belgium / University	113 (47/66)	NM (42-45)	Immediate	Mx	Osseospeed (AstraTech AB, Mölndal, Sweden)	No
Correia	2017	RA (unicenter)	Portugal / Private practice	202 (70/132)	23-73 (50)	Immediate, delayed	Mx, Md	Several (Straumann, Nobel Biocare, Biomet 3i, Neodent, Klockner, EuroTeknika)	15 light smokers 29 heavy smokers
Cosyn	2012	RA (unicenter)	Belgium / University	461 (216/245)	18-90 (51)	Immediate, within 3 mo, delayed	Mx, Md	Several (Nobel Biocare, Straumann, Dentsply Friadent, Astra Tech, Biomet 3i)	Yes, but exact number not informed
Cosyn	2013	CCT (multicenter)	Belgium / University	104 (43/61)	22-80 (51)	Immediate, delayed (3-6 mo)	Mx	TiUnite NobelReplace (Nobel Biocare, Göteborg, Sweden)	18 smokers
Covani	2012	RA (unicenter)	Italy / Private practice	19 (6/13)	39-72 (60)	Immediate	Mx, Md	Ossean, (Intra-Lock International, Inc, Boca Raton, USA)	Light smokers, but exact number not informed
Crespi	2014	RCT (unicenter)	Italy / University	28 (13/15)	46-77 (59.3)	Immediate	Mx, Md	Outlink (Sweden & Martina, Due Carrare, Italy)	Light smokers, but the exact number was not informed
Cucchi	2019	PS (NM)	Italy / NM	20 (NM)	NM (67)	Early (3-5 d)	Mx, Md	NM	28% of the implants in smokers
Davarpanah	2005	CCT (unicenter)	France / Private practice	92 (36/56)	NM (59.8)	Delayed (3-6 mo)	Mx, Md	Osseotite NT (Biomet 3i, Palm Beach Gardens, USA)	Yes, but exact number not informed
De Bruyn	2002	CCT (unicenter)	Belgium / University	36 (18/18)	63-81 (NM)	Within 8 days	Md	Brånemark (Nobel Biocare AB, Göteborg, Sweden)	Yes, but exact number not informed
De Bruyn	2013	CCT (multicenter)	Belgium, Spain, USA, Germany / University	113 (47/66)	NM (42-45)	Immediate	Mx	Osseospeed (Astra Tech AB, Mölndal, Sweden)	No
Degasperi	2014	RA (NM)	Italy / Private practice	49 (20/49)	29-79 (50.9)	Delayed (3-4 mo)	Mx, Md	Neoss Proactive (Neoss Ltd, Harrogate, UK)	NM
Degidi	2006	RA (unicenter)	Italy / University	111 (46/65)	15-83 (40)	Immediate	Mx, Md	Several	19 light and heavy smokers
Degidi	2007	CCT (unicenter)	Italy / University	NM	15-83 (55)	Immediate	Mx, Md	Several	Yes, but exact number not informed
Degidi	2007	RA (unicenter)	Italy / University	133 (NM)	41-80 (56)	Immediate	Mx, Md	Several	Yes, but exact number not informed
Degidi	2007	PS (unicenter)	Italy / University	50 (22/28)	42-77 (57.5)	Immediate	Md	Brånemark (Nobel Biocare, Göteborg, Sweden), Frialit, XiVE, IMZ, and Frialoc (Dentsply Friadent), Maestro (BioHorizons), Restore (Lifecore)	Light and heavy smokers, but the exact number was not informed

Degidi	2012	RA (unicenter)	Italy / University	1045 (NM)	18-93 (NM)	NM	Mx, Md	XiVe (Dentsply Friadent, Mannheim, Germany)	Yes, but exact number not informed
Degidi	2015	PS (unicenter)	Italy / Private practice	114 (NM)	NM (53.1)	Immediate	Mx, Md	XiVE (Dentsply, Mannheim, Germany)	34 smokers
Deng	2010	CCT (unicenter)	China / University	12 (4/8)	40-75 (62)	Immediate	Mx, Md	TiUnite, Brånemark System Mk III, NobelSpeedy (Nobel Biocare, Göteborg, Sweden)	9 smokers
Dhanrajani	2005	RA (unicenter)	Saudi Arabia / Private practice	101 (30/71)	17-69 (NM)	Immediate, delayed	Mx, Md	Brånemark (Nobel Biocare AB, Göteborg, Sweden), Osseotite NT (Biomet 3i, Palm Beach Gardens, USA), Omniloc (Calcitek Sulzer, Carlsbad, USA), Steri-Oss, Replace (Nobel Biocare AB, Göteborg, Sweden)	17 light smokers 7 heavy smokers
Di Alberti	2012	CCT (unicenter)	Italy / Private practice	70 (33/37)	16-71 (45)	Immediate	Mx	Seven (MIS)	NM
Esposito	2010	RCT (multicenter)	Italy / Private practice	506 (236/270)	18-86 (48)	Not loaded	Mx, Md	Several	115 light smokers 54 heavy smokers
Esposito	2012	RCT (multicenter)	Italy / Private practice	60 (31/29)	25-81 (53)	Early (within 2 wk)	Mx	Xpeed (MegaGen Implant, Gyeongbuk, South Korea)	8 light smokers 3 heavy smokers
Esposito	2015	RCT (multicenter)	Italy / Private practice	106 (46/60)	28-72 (49)	Immediate	Mx	EZ Plus (MegaGen Implant, Gyeongbuk, South Korea)	15 light smokers 7 heavy smokers
Esposito	2017	RCT (multicenter)	Italy / Private practice	210 (107/103)	29-79 (54)	Delayed (4 mo)	Mx, Md	NobelActive (Nobel Biocare, Göteborg, Sweden)	59 light smokers 16 heavy smokers
Evian	2004	RA (unicenter)	USA / University	149 (NM)	NM	Delayed (4-6 mo)	Mx, Md	NM (Paragon, Zimmer Dental, Carlsbad, USA)	NM
Feher	2020	RA (unicenter)	Austria / University	1132 (505/627)	NM (50.6)	Not loaded	Mx, Md	NM	157 light smokers 60 heavy smokers
Felice	2011	RCT (multicenter)	Italy / Private practice	106 (46/60)	28-72 (49)	Immediate, delayed (4 mo)	Mx	EZ Plus (MegaGen, Gyeongbuk, South Korea)	15 light smokers 7 heavy smokers
Felice	2014	RCT (multicenter)	Italy / Private practice	64 (35/29)	19-80 (52)	Immediate, early, delayed	Mx, Md	Way Milano and Kentron (Geass srl, Pozzuolo Del Friuli, Udine, Italy)	11 light smokers 6 heavy smokers
Felice	2015	RCT (multicenter)	Italy / Private practice	50 (25/25)	32-72 (52)	Immediate, delayed (4 mo)	Mx	XiVE S plus (Dentsply Friadent, Mannheim, Germany)	17 light smokers 3 heavy smokers
Felice	2016	RCT (multicenter)	Italy / Private practice + University	150 (66/84)	20-86 (54)	Delayed (3 mo)	Mx, Md	TwinKon Universal SA2 (Global D, Lyon, France)	33 light smokers 7 heavy smokers
Gehrke	2015	CCT (unicenter)	Brazil / NM	77 (24/53)	26-65 (NM)	Not loaded	Mx, Md	NM (Implacil De Bortoli, São Paulo, Brazil)	No
Gelb	2013	RA (multicenter)	USA / Private practice	52 (21/31)	35-82 (64.1)	Delayed (4-12 mo)	Mx, Md	TiUnite (Nobel Biocare, Göteborg, Sweden)	3 smokers
Gillot	2011	RA (multicenter)	France / Private practice	105 (53/52)	NM (58.7)	Immediate	Md	TiUnite (Nobel Biocare, Göteborg, Sweden)	Smokers (<15 cig/day) included, but the exact number was not informed

Gillot	2012	RA (multi-center)	France / Private practice	113 (56/57)	37-93 (60.4)	Immediate	Mx	TiUnite MkIII, MkIV, Speedy, NobelActive (Nobel Biocare, Göteborg, Sweden)	Smokers (<15 cig/day) included, but the exact number was not informed
Giordano	2017	RA (unicenter)	Italy / Private practice	104 (43/61)	37-87 (61.2)	Immediate	Mx, Md	SPI-Contact (Thommen Medical, Grenchen, Switzerland)	20 light smokers 24 heavy smokers
Gomez-Roman	1997	RA (unicenter)	Germany / University	376 (199/177)	15-88 (38.8)	Delayed (3-8 mo)	Mx, Md	Frialit-2 (Dentsply Friadent, Mannheim, Germany)	NM
Grandi	2013	CCT (multi-center)	Italy / Private practice	50 (21/29)	31-73 (56)	Immediate	Mx	JD Evolution (J DentalCare, Modena, Italy)	19 light and heavy smokers
Grandi	2015	RCT (multi-center)	Italy / Private practice	105 (50/55)	21-75 (47)	Immediate, early, delayed	Mx, Md	JD Evolution (J DentalCare, Modena, Italy)	19 light smokers 6 heavy smokers
Guarnieri	2020	RA (multi-center)	Italy / Private practice	274 (146/128)	45-75 (48.1)	Immediate, delayed	Mx, Md	BioHorizons TLX and TRX (BioHorizons)	124 smokers
Haas	1996	RA (unicenter)	Austria / University	607 (246/361)	21-86 (51.5)	Delayed (3-6)	Mx, Md	IMZ (Friatec, Friedrichseld, Germany)	NM
Horwitz	2007	CCT (unicenter)	Israel / Private practice	19 (2/17)	34-79 (NM)	Delayed (6 mo)	Mx, Md	NM (MIS Implant Technologies, Shlomi, Israel)	NM
Huynh-Ba	2019	RCT (unicenter)	USA / University	35 (18/17)	27-74 (52)	Delayed (4 mo)	Mx, Md	Bone Level SLActive (Straumann, Basel, Switzerland)	Light smokers, but exact number not informed
Irinakis	2009	CCT (multicenter)	Canada / Private practice	67 (NM)	NM	Immediate, delayed	Mx, Md	NobelActive (Nobel Biocare, Göteborg, Sweden)	NM
Jaffin	2004	RA (unicenter)	USA / University	34 (19/15)	43-82 (60)	Immediate	Mx	SLA (Straumann, Waldenburg, Switzerland)	Yes, but exact number not informed
Ji	2012	RA (unicenter)	USA / University	45 (18/27)	25-88 (61.5)	Immediate	Mx, Md	TiUnite (Nobel Biocare, Göteborg, Sweden), NM (Zimmer Dental, Carlsbad, USA), XiVe (Dentsply Friadent, Mannheim, Germany)	8 smokers
Kim	2017	RA (unicenter)	South Korea / University	116 (55/61)	17-76 (50.9)	Delayed (10-22 wk)	Mx, Md	Oneplant (Warantec, Seoul, Republic of Korea) IS-II (Neobiotech, Seoul, Republic of Korea)	NM
Kohen	2016	RA (unicenter)	Israel / Private practice	343 (NM)	> 18	Immediate, early, delayed	Mx, Md	Several (SPI; DFI; Arrow, Alph-Bio-Tec; screw-vent TSV, Zimmer Dental; Maestro, BioHorizons HPI Inc)	NM
Kourtis	2004	RA (multicenter)	Greece / Private practice + University	405 (171/234)	18-83 (54.3)	Immediate, delayed	Mx, Md	Several (IMZ, Frialit-2, Free-Hex, Frialoc, Friadent Co., Mannheim, Germany)	Yes, but exact number not informed
Krennmair	2014	PS (unicenter)	Austria / University	24 (14/10)	38-84 (61.5)	Immediate	Md	Screw-Line Promote plus (Camlog, Wimsheim, Germany)	Light smokers, but exact number not informed
Lee	2018	RA (unicenter)	Taiwan / Private practice	161 (NM)	23-90 (53)	Immediate, delayed	Mx, Md	IDEOSS (IDEOSS Biotech, Taipei, Taiwan)	Yes, but the exact number was not reported
Lee	2020	RCT (unicenter)	Switzerland / University	20 (12/8)	≥ 22	Delayed (8 wk)	Mx, Md	BLT (Straumann, Basel, Switzerland)	NM
Leonida	2012	RA (unicenter)	Italy / University	9 (1/8)	45-68 (NM)	Immediate	Md	Way (Geass, Pozzuolo del Friuli, Italy)	No

Lindeboom	2006	RCT (unicenter)	Netherlands / University	50 (25/25)	19-69 (39.7)	Delayed (6 mo)	Mx	Frialit-2 Synchro (Dentsply Friadent, Mannheim, Germany)	No
Locante	2004	RA (unicenter)	USA / Private practice	86 (35/51)	12-81 (NM)	Immediate	Mx	Stabledent (Crystal Medical Technology, Pelham, USA)	9 smokers
Luongo	2014	CCT (multicenter)	Italy / Private practice	46 (23/23)	18-73 (44.5)	Immediate	Mx, Md	AnyRidge (MegaGen, Gyeongbuk, South Korea)	17 smokers
Malchiodi	2011	RA (unicenter)	Italy / University	81 (NM)	NM	Immediate	Mx	Osseotite Certain (Biomet 3i, Palm Beach Gardens, USA), FBR Pitt-Easy (Oraltronic, Bremen, Germany)	Yes, but exact number not informed
Malchiodi	2016	RCT (unicenter)	Italy / University	40 (24/16)	35-75 (52)	Delayed (3 mo)	Mx, Md	SybronPRO XR (Sybron Implant Solutions)	10 light and heavy smokers
Maló	2000	RA (unicenter)	Portugal / Private practice	49 (18/31)	16-64 (42)	Immediate	Mx, Md	Brånemark MkII (Nobel Biocare AB, Göteborg, Sweden)	Light smokers, but exact number not informed
Maló	2003	CCT (multicenter)	Portugal, Sweden, Italy / Private practice + Public service	76 (41/35)	18-81 (41)	Immediate	Mx, Md	Brånemark (Nobel Biocare AB, Göteborg, Sweden)	24 heavy smokers
Maló	2003	RA (unicenter)	Portugal / Private practice	44 (15/29)	30-79 (59)	Immediate	Md	Brånemark MkII and MkIII (Nobel Biocare AB, Göteborg, Sweden)	NM
Mangano	2013	RA (unicenter)	Italy / Private practice	40 (26/14)	18-62 (45)	Immediate	Mx	NM (Sistema Implantare Leone, Sesto Fiorentino, Italy)	Patients smoking less than 15 cig./day
Mangano	2017	RA (multicenter)	Brazil, Italy / Private practice	103 (43/60)	24-65 (41.4)	Immediate	Mx	Tixos (Leader Implants, Milan, Italy)	No
Meizi	2014	CCT (unicenter)	Israel / NM	155 (40/95)	20-70 (47.5)	Immediate, delayed (3-6 mo)	Mx, Md	Saturn (Cortex Dental, Shlomi, Israel)	12 heavy smokers
Mensdorff-Pouilly	1994	RA (unicenter)	Austria / University	31 (12/19)	NM	Delayed (3-6 mo)	Mx, Md	IMZ (Friatec, Mannheim, Germany), Brånemark (Nobel Biocare, Göteborg, Sweden)	NM
Mertens	2011	CCT (unicenter)	Germany / University	17 (5/12)	40-83 (61)	Immediate, delayed (mean 9.5 wk)	Mx, Md	Osseospeed (AstraTech AB, Mölndal, Sweden)	2 smokers
Moraes	2013	RA (multicenter)	Brazil / University, private practice	27 (9/18)	25-80 (56)	Delayed (4-6 mo)	Mx, Md	Way Syntegra (Geass, Udine, Italy)	NM
Noelken	2014	RA (unicenter)	Germany / Private practice	20 (10/10)	31-69 (NM)	Immediate	Mx, Md	NobelPerfect (Nobel Biocare, Göteborg, Sweden)	5 smokers
Norton	2004	CCT (unicenter)	UK / Private practice	25 (10/15)	27-72 (48.2)	Immediate	Mx	TiO-Blast (AstraTech ST, Mölndal, Sweden)	Yes, but exact number not informed
Norton	2017	PS (unicenter)	United Kingdom / Private practice	22 (10/12)	22-79 (NM)	Immediate	Mx, Md	Astra Tech AV (Dentsply, Mölndal, Sweden)	1 light smoker
Oliva	2012	RA (unicenter)	Spain / Private practice	17 (11/6)	39-79 (52.9)	Delayed (4 mo)	Mx, Md	Straumann (Straumann, Basel, Switzerland), Osstem (Osstem, Seoul, South Korea)	8 smokers

Ormianer	2008	RA (multicenter)	Israel / Private practice	60 (26/34)	18-78 (53)	Immediate, delayed	Mx, Md	Tapered Screw-Vent MTX (Zimmer Dental, Inc, Carlsbad, USA)	2 smokers
Ormianer	2012	RA (unicenter)	Israel / Private practice	46 (19/27)	NM (50)	Immediate, delayed	Mx	Tapered Screw-Vent MTX (Zimmer Dental, Inc, Carlsbad, USA)	1 smoker
Oxby	2015	RA (unicenter)	Sweden / Private practice	39 (17/22)	> 20 (68)	Early (within 60 d)	Mx, Md	OsseoSpeed (Astra Tech, Dentsply Implants, Mölndal, Sweden)	1 extra-heavy smoker
Palattella	2008	RCT (unicenter)	Italy / University	16 (6/10)	21-49 (35)	Immediate	Mx	SLA (Straumann, Basel, Switzerland)	Only light smokers, but exact number not informed
Pellicer-Chover	2014	RCT (unicenter)	Spain / University	15 (9/6)	NM (63.7)	Delayed (10-12 wk)	Mx, Md	Kohno SP (Sweden & Martina, Due Carrare, Italy)	No
Peñarrocha-Diogo	2008	RA (unicenter)	Spain / University	100 (45/55)	20-76 (47.5)	Delayed (6-8 wk)	Mx, Md	Defcon Avantblast, Impladent (Sentmenat, Barcelona, Spain)	10 light smokers 31 heavy smokers
Peñarrocha-Diogo	2011	RA (unicenter)	Spain / University	30 (13/17)	36-68 (53.2)	Delayed (6-10 wk)	Mx, Md	Defcon Avantblast TSA, Impladent (Senmenat, Barcelona, Spain)	Light smokers, but exact number not informed
Peñarrocha-Diogo	2012	RA (unicenter)	Spain / University	150 (73/77)	25-80 (55.4)	Delayed (2-3 mo)	Mx, Md	Defcon implants (Impladent SL, Barcelona, Spain)	NM
Peñarrocha-Oltra	2012	RA (unicenter)	Spain / University	70 (32/38)	34-75 (54)	Delayed (8-10 wk)	Mx	NM	27 light smokers
Peñarrocha-Oltra	2013	CCT (unicenter)	Spain / University	29 (13/16)	28-77 (55.4)	Immediate, delayed (2 mo)	Mx	Kohno SP (Sweden & Martina, Due Carrare, Italy)	No
Perry	2004	RA (multicenter)	USA / Private practice	442 (194/248)	17-92 (55)	Delayed (3-5 mo)	Mx, Md	Frialit-2 (Dentsply Friadent, Mannheim, Germany)	NM
Pettersson	2015	RA (unicenter)	Sweden / Private practice	88 (32/56)	NM (65)	Delayed (3-4 mo)	Mx, Md	Replace Select TiUnite (Nobel Biocare, Göteborg, Sweden)	Yes, but exact number not informed
Piek	2013	CCT (unicenter)	Israel / University	141 (58/83)	NM (57.6)	Immediate, delayed	Mx, Md	NM (Paltop Advanced Dental Solutions Ltd., Caesarea, Israel)	16 smokers
Pieri	2009	CCT (unicenter)	Italy / Private practice	23 (10/13)	51-72 (61.9)	Immediate	Mx, Md	NM (Keystone Dental, Burlington, USA)	Light smokers, but exact number not informed
Polizzi	2000	CCT (multicenter)	Many countries / Private practice+ University	143 (68/75)	NM (47, females) NM (40, males)	Delayed (3-6 mo)	Mx, Md	Brånemark (Nobel Biocare AB, Göteborg, Sweden)	NM
Polizzi	2015	RA (unicenter)	Italy / Private practice	27 (7/20)	34-71 (55.8)	Immediate	Mx	Nobel Speedy Groovy, Nobel Replace Select Tapered (Nobel Biocare, Göteborg, Sweden)	Yes, but exact number not informed
Pozzi	2014	RA (unicenter)	Italy / Private practice	73 (32/41)	19-76 (50.59)	Immediate, delayed	Mx, Md	MK III, MK IV, Nobel Replace Select Tapered (Nobel Biocare, Göteborg, Sweden)	NM
Pozzi	2015	PS (unicenter)	Italy / University	54 (22/32)	23-80 (56.2)	Immediate	Mx, Md	Nobel Replace Conical Connection (Nobel Biocare, Göteborg, Sweden)	3 light smokers
Pozzi	2016	RA (multicenter)	Italy / Private practice	64 (26/38)	21-80 (52.8)	Immediate	Mx, Md	Nobel Replace Conical Connection (Nobel Biocare, Göteborg, Sweden)	Only light smokers, but exact number not informed

Prati	2020	PS (multi-center)	Italy / University + Private practice	76 (34/42)	NM (55.6)	Delayed (3 mo)	Mx, Md	Premium SP (Sweden & Martina, Due Carrare, Italy)	8 heavy smokers
Prati	2020	PS (multi-center)	Italy / University + Private practice	56 (27/29)	NM (55)	Delayed (3 mo)	Mx, Md	Prama (Sweden & Martina, Due Carrare, Italy)	Only light smokers, but exact number not informed
Raes	2012	CCT (unicenter)	Belgium / University	96 (41/55)	18-72 (43)	Immediate	Mx	Osseospeed (AstraTech AB, Mölndal, Sweden)	No
Raes	2013	CCT (unicenter)	Belgium / University	48 (27/21)	NM	Immediate	Mx	Osseospeed (AstraTech AB, Mölndal, Sweden)	4 former smokers
Raes	2017	CCT (multi-center)	Belgium, USA, Spain / University	96 (41/55)	18-72 (43)	Immediate	Mx	OsseoSpeed (Astra Tech, Dentsply Implants, Mölndal, Sweden)	No
Raes	2018	PS (multi-center)	Italy, Belgium / Private practice + University	46 (23/23)	18-73 (44.5)	Immediate	Mx, Md	AnyRidge (MegaGen Implant, Gyeongbuk, South Korea)	17 smokers
Ribeiro	2008	RA (multicenter)	Brazil / University	64 (27/37)	23-71 (45.4)	Immediate	Mx	NM (Conexão, São Paulo, Brazil)	NM
Rodrigo	2012	CCT (unicenter)	Spain / Private practice	22 (8/14)	33-76 (59.3)	Immediate, delayed (2-4 mo)	Mx, Md	SLA (Straumann, Basel, Switzerland)	3 light smokers 3 heavy smokers 2 extra-heavy smokers
Romanos	2012	RA (unicenter)	Germany / Private practice	55 (20/35)	NM (63)	Immediate	Md	Ankylos (Friadent, Mannheim, Germany)	NM
Romanos	2014	RA (NM)	NM	27 (15/12)	NM (59)	Immediate	Mx, Md	Ankylos (Dentsply Implants, Mölndal, Sweden)	2 light smokers 6 extra-heavy smokers
Romanos	2014	RA (NM)	NM	26 (6/20)	NM (57)	Immediate	Mx	Ankylos (Dentsply Implants, Mölndal, Sweden)	NM
Saridakis	2018	RA (unicenter)	Germany / University	98 (NM)	> 18	Immediate, delayed	Mx, Md	Nobel Active (Nobel Biocare, Göteborg, Sweden)	No
Sato	2014	PS (multi-center)	Japan / University + Private practice	63 (25/38)	NM (54)	Immediate	Mx, Md	Nobel Direct (Nobel Biocare, Göteborg, Sweden)	14 smokers
Schiegnitz	2016	RA (unicenter)	Germany / University	90 (38/52)	22-87 (57.7)	NM	Mx, Md	Straumann TE (Straumann, Basel, Switzerland)	NM
Schlee	2014	PS (multi-center)	Netherlands, Germany, Italy, France, Spain / Private practice	105 (50/55)	22-77 (55.2)	NM	Mx, Md	Trabecular Meta Material (Zimmer TMT, Parsippany, USA)	17 light and heavy smokers
Schoenbaum	2021	RA (multi-center)	USA / Private practice	378 (181/197)	NM (60)	NM	Mx, Md	NM	15% of the implants in smokers and former smokers
Sennerby	2008	RA (multicenter)	Sweden, Italy, USA / University + Private practice	43 (20/23)	NM (50)	Immediate/early, delayed (6 wk-6 mo)	Mx, Md	TiUnite, NobelDirect (Nobel Biocare, Göteborg, Sweden)	NM
Siciliano	2009	CCT (unicenter)	Italy / University	30 (16/14)	NM (49)	Delayed (3 mo)	Mx, Md	Straumann TE (Straumann, Basel, Switzerland)	No

Siebers	2010	CCT (unicenter)	Germany / Private practice	76 (34/42)	22-85 (52)	Delayed (4-6 mo)	Mx, Md	Camlog Rootline and Screw Line (Camlog Biotechnologies, Basel, Switzerland), Osseotite (Biomet 3i, Palm Beach Gardens, USA), Restore RBM (Lifecore Biomedical, Chaska, USA)	15 smokers
Swart	2014	PS (unicenter)	South Africa / Private practice	8 (NM)	38-72 (60)	Immediate	Md	NM	Light and heavy smokers, but exact number not informed
Tallarico	2016	RA (NM)	NM	56 (25/31)	NM (66.2)	Immediate, delayed	Mx, Md	NobelReplace Conical Connection, NobelSpeedy Groovy, Brånemark MKIII, NobelReplace Tapered Groovy (Nobel Biocare, Göteborg, Sweden)	3 light smokers
Tallarico	2017	RCT (unicenter)	Italy / Private practice	24 (8/16)	37-67 (53)	Delayed (4 mo)	Mx, Md	Ultra-Wide (Osstem, Seoul, South Korea)	No
Testori	2014	RA (unicenter)	Italy / University	80 (38/42)	NM (59)	Immediate, delayed	Mx, Md	NM (Biomet 3i, Garden Beach, USA)	11 light smokers 15 heavy smokers
Thome	2020	RA (unicenter)	Brazil / Private practice	101 (48/53)	NM (59.2)	Immediate, delayed	Mx, Md	Helix Acqua GM (Neodent, Curitiba, Brazil)	NM
Thome	2021	RA (unicenter)	Brazil / University	67 (NM)	NM (60.6)	Immediate	Mx, Md	Helix Acqua GM (Neodent, Curitiba, Brazil)	NM
Tonetti	2017	RCT (multicenter)	Italy, China / Private practice + University	124 (40/84)	NM (50-55; 2 groups)	Delayed (12 wk)	Mx, Md	SPI Contact (Thommen Medical AG, Waldenburg, Switzerland)	18 smokers
Urdaneta	2012	RA (unicenter)	USA / Private practice	291 (147/144)	NM	NM	Mx, Md	Integra-CP (Bicon, Boston, USA)	Yes, but exact number not informed
van Kesteren	2010	RCT (unicenter)	USA / Private practice	24 (NM)	28-76 (NM)	Not loaded	Mx, Md	SLA (Straumann, Waldenburg, Switzerland)	Yes, but exact number not informed
Vandeweghe	2012	RA (multicenter)	Belgium, South Africa, Germany, UK/ University + Private practice	75 (31/44)	25-82 (58)	Immediate, delayed (3 mo)	Mx, Md	NM (Max Southern Implants, Irene, South Africa)	6 light smokers 4 heavy smokers
Walton	2016	PS (unicenter)	Australia / Private practice	184 (82/102)	15-79 (46.2)	Immediate, delayed (>3 mo)	Mx, Md	MK III, MK IV, Replace Select, NobelActive, Speedy Groovy TiUnite (Nobel Biocare, Göteborg, Sweden)	Yes, but exact number not informed
Watzek	1995	RA (unicenter)	Austria / University	20 (6/14)	NM	Delayed (3-6 mo)	Mx, Md	Brånemark (Nobel Biocare AB, Göteborg, Sweden), TPS (Friedrichsfeld AG, Mannheim, Germany)	NM
Wolfinger	2003	RA (unicenter)	USA / Private practice	10 (NM)	45-70 (55)	Immediate, delayed (3 mo)	Md	Brånemark (Nobel Biocare AB, Göteborg, Sweden)	NM
Zafiropoulos	2010	RA (unicenter)	Germany / Private practice	252 (127/114)	43-70 (49)	Immediate	Mx	Camlog root line (Altatec, Wimsheim, Germany), SLA (Straumann, Waldenburg, Switzerland)	86 smokers

[illegible]

Noelken	2014	1	1	0	1	1	1	1	1	1	8/9
Norton (1)	2004	1	1	1	1	1	1	1	0	1	8/9
Norton (2)	2017	1	1	1	1	1	1	1	1	1	9/9
Oliva	2012	1	1	0	1	1	1	1	0	1	7/9
Ormianer (1)	2008	1	1	0	1	1	1	1	1	1	8/9
Ormianer (2)	2012	1	1	0	1	1	1	1	1	1	8/9
Oxby	2015	1	1	1	1	1	1	1	1	1	9/9
Palattella	2008	1	1	0	1	1	1	1	0	1	7/9
Pellicer-Chover	2014	1	1	0	1	1	1	1	0		7/9
Peñarrocha-Diago (1)	2008	1	1	0	1	1	1	1	1	1	8/9
Peñarrocha-Diago (2)	2011	1	1	0	1	1	1	1	0	1	7/9
Peñarrocha-Diago (3)	2012	1	1	0	1	1	1	1	0	1	7/9
Peñarrocha-Oltra (1)	2012	1	1	0	1	1	1	1	1	1	8/9
Peñarrocha-Oltra (2)	2013	1	1	1	1	1	1	1	1	1	9/9
Perry	2004	1	1	1	1	1	1	1	0	1	8/9
Pettersson	2015	1	1	1	1	1	1	1	0	1	8/9
Piek	2013	1	1	0	1	1	1	1	1	1	8/9
Pieri	2009	1	1	1	1	1	1	1	1	1	9/9
Polizzi (1)	2000	1	0	1	1	1	1	1	0	1	7/9
Polizzi (2)	2015	1	1	1	1	1	1	1	1	1	9/9
Pozzi (1)	2014	1	1	1	1	1	1	1	1	1	9/9
Pozzi (2)	2015	1	1	1	1	1	1	1	1	1	9/9
Pozzi (3)	2016	1	1	1	1	1	1	1	1	1	9/9
Prati (1)	2020	1	1	1	1	1	1	1	1	1	9/9
Prati (2)	2020	1	1	1	1	1	1	1	1	1	9/9
Raes (1)	2012	1	1	0	1	1	1	1	1	1	8/9
Raes (2)	2013	1	1	1	1	1	1	1	1	1	9/9
Raes (3)	2017	1	1	0	1	1	1	1	1	1	8/9
Raes (4)	2018	1	1	0	1	1	1	1	1	1	8/9
Ribeiro	2008	1	1	1	1	1	1	1	0	1	8/9
Rodrigo	2012	1	1	1	1	1	1	1	1	1	9/9
Romanos (1)	2012	1	1	0	1	1	1	1	0	1	7/9
Romanos (2)	2014	1	1	0	1	1	1	1	0	1	7/9
Romanos (3)	2014	1	1	0	1	1	1	1	0	1	7/9
Saridakis	2018	1	1	0	1	1	1	1	1	1	8/9
Sato	2014	1	1	0	1	1	1	1	0	1	7/9
Schiegnitz	2016	1	1	0	1	1	1	1	1	1	8/9
Schlee	2014	1	1	0	1	1	1	1	1	1	8/9

Schoenbaum	2021	1	1	0	1	1	1	1	1	1	8/9
Sennerby	2008	1	1	1	1	1	1	1	0	1	8/9
Siciliano	2009	1	1	1	1	1	1	1	1	1	9/9
Siebers	2010	1	1	0	1	1	1	1	0	1	7/9
Swart	2014	1	1	1	1	1	1	1	0	1	8/9
Tallarico (1)	2016	1	1	1	1	1	1	1	1	1	9/9
Tallarico (2)	2017	1	1	1	1	1	1	1	1	1	9/9
Testori	2014	1	1	1	1	1	1	1	1	1	9/9
Thome (1)	2020	1	1	1	1	1	1	1	1	1	9/9
Thome (2)	2021	1	1	0	1	1	1	1	1	1	8/9
Tonetti	2017	1	1	1	1	1	1	1	1	1	9/9
Urdaneta	2012	1	1	0	1	1	1	1	1	1	8/9
van Kesteren	2010	1	1	0	1	1	1	1	1	1	8/9
Vandeweghe	2012	1	1	1	1	1	1	1	0	1	8/9
Walton	2016	1	1	1	1	1	1	1	1	0	9/9
Watzek	1995	1	1	0	1	1	1	1	0	1	7/9
Wolfinger	2003	1	1	1	1	1	1	1	0	1	8/9
Zafiropoulos	2010	1	1	0	1	1	1	1	1	1	8/9
Zumstein	2016	1	1	1	1	1	1	1	1	1	9/9

^a 3 months of follow-up was considered to be of adequate length.