TABLE E-1 Baseline Characteristics of Included Studies

Study	Age*† *(yr)*	No. of Procedures (Total Knee Arthroplasty + Total Hip Arthroplasty)	Female Sex (N)	Joint Age*†	Prevalence of Prosthetic Joint Infection
Chevillotte et al., 2009	70 (NR)*	204	111	NR	10%
Schinsky et al., 2008	64.9 (30 to 94)	201	127	7.2 yr (NR)	27%
Pfitzner et al., 2008	67.4 (48 to 81)	50	34	7.6 mo (0.3 to 36 mo)	50%
Müller et al., 2008	69 (46 to 84)	50	27	NR (1 mo to 17 yr)	74%
Kanner et al., 2008	NR	244	0	NR	11%
Ghanem et al., 2008	67 (43 to 94)	429	223	NR	38%
Fuster et al., 2008	68 ± 13	70	42	46 mo (NR)	17%
Fink et al., 2008	68.4 (30 to 87)	145	81	38.2 mo (2 to 252 mo)	28%
Austin et al., 2008	66 (NR)	296	171	NR	39%
Simonsen et al., 2007	73.35 (47 to 95)	76	41	1.8 yr (0.17 to 14 yr)	36%
Nilsdotter-Augustinsson et al., 2007	72.8 (30 to 86)	85	35	4.76 yr (0.2 to 22 yr)	29%
Greidanus et al., 2007	67 (41 to 90)	151	74	NR	30%
Della Valle et al., 2007	66.6 (34 to 89)	94	56	NR	44%
Bottner et al., 2007	64.5 (19 to 90)	78	37	NR	27%
Baré et al., 2006	NR	295	0	NR	27%
Di Cesare et al., 2005	63 (25 to 87)	58	33	84 mo (5 to 256 mo)	29%
Savarino et al., 2004	62.3 (40 to 86)	26	17	NR	62%
Bernard et al., 2004	69 (40 to 100)	230	116	NR	91%
Kordelle et al., 2004	69.69 (NR)	50	25	NR	58%
Itasaka et al., 2001	67.5 (49 to 78)	48	38	10.9 yr (2 to 18 yr)	13%
Klett et al., 2001	70 (50 to 86)*	35	18	NR	43%
Teller et al., 2000	61.7	166	108	Median, 7.13 yr (NR)	13%
Spangehl et al., 1999	65 (27 to 88)	202	122	NR	17%
Lachiewicz et al., 1996	59 (23 to 87)	142	70	7.4 yr (4 mo to 20 yr)	15%
Duff et al., 1996	67 (31.5 to 85.6)	64	38	4.5 yr (NR)	30%
Roberts et al., 1992	NR	78	0	NR	19%
Thorén and Wigren, 1991	67.2 (42 to 88)	79	28	42.7 mo (6 to 149 mo)	65%
Levitsky et al., 1991	66.4 (31 to 89)	72	0	75 mo (6 mo to 25 yr)	14%
Sanzén and Carlsson, 1989	69.6 (39 to 84)	108	0	NR	21%

Magnuson et al., 1988	68.5 (22 to 89)*	83	48	NR	60%

*The values are given as the mean, with the range in parentheses, unless otherwise specified. †NR = not reported.

TABLE E-2 Quality Assessment of the Included Studies Using QUADAS Criteria*†

Study	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Y/NU‡
Chevillotte et al., 2009	N	Y	Y	U	Y	Y	Y	Y	Y	Y	Y	N	9/3
Schinsky et al., 2008	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	U	11/1
Pfitzner et al., 2008	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	U	11/1
Müller et al., 2008	Y	Y	Y	Y	Y	Y	N	Y	Y	U	Y	Y	9/3
Kanner et al., 2008	Y	Y	Y	Y	Y	Y	N	Y	Y	U	Y	Y	10/2
Ghanem et al., 2008	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	11/1
Fuster et al., 2008	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	11/1
Fink et al., 2008	N	Y	Y	Y	Y	Y	U	Y	Y	U	Y	Y	9/3
Austin et al., 2008	Y	Y	Y	U	N	Y	Y	Y	Y	Y	U	U	8/4
Simonsen et al., 2007	N	Y	N	N	Y	N	Y	U	U	Y	Y	Y	6/6
Nilsdotter-Augustinsson et al., 2007	Y	U	N	Y	N	U	Y	Y	N	Y	Y	N	6/6
Greidanus et al., 2007	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	U	11/1
Della Valle et al., 2007	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	N	10/2
Bottner et al., 2007	Y	Y	U	Y	Y	Y	Y	Y	Y	Y	Y	N	10/2
Baré et al., 2006	Y	Y	N	U	U	Y	N	Y	Y	Y	Y	N	7/5
Di Cesare et al., 2005	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	11/1
Savarino et al., 2004	Y	U	N	U	U	Y	U	Y	U	U	N	N	3/9
Bernard et al., 2004	Y	Y	Y	U	U	Y	Y	Y	Y	Y	Y	N	9/3
Itasaka et al., 2001	Y	Y	U	U	U	Y	Y	Y	U	Y	Y	N	7/5
Teller et al., 2000	N	Y	U	U	Y	Y	Y	Y	N	U	N	N	5/7
Spangehl et al., 1999	Y	Y	Y	Y	Y	Y	N	Y	Y	Y	Y	N	10/2
Lachiewicz et al., 1996	Y	Y	Y	Y	Y	Y	Y	Y	Y	U	Y	U	10/2
Duff et al., 1996	Y	Y	Y	Y	Y	Y	U	U	Y	U	Y	U	8/4
Roberts et al., 1992	N	Y	N	U	Y	Y	Y	U	Y	U	U	N	5/7
Thorén and Wigren, 1991	Y	Y	Y	U	Y	U	Y	U	Y	Y	Y	N	8/4
Levitsky et al., 1991	Y	Y	U	U	Y	Y	Y	U	N	Y	Y	N	5/7
Sanzén and Carlsson, 1989	U	Y	U	Y	N	Y	Y	U	U	U	Y	N	5/7
Magnuson et al., 1988	N	U	U	U	Y	Y	Y	U	U	U	Y	U	4/8
Kordelle et al., 2004	Y	Y	Y	Y	Y	Y	Y	Y	Y	U	U	Y	10/2
Klett et al., 2001	Y	Y	Y	Y	Y	Y	Y	N	Y	U	N	U	8/4
Percent “yes”	77%	90%	63%	60%	77%	90%	73%	73%	73%	60%	80%	17%	

*Q1: Was the spectrum of patients representative of the patients who will receive the test in practice? Q2: Were selection criteria clearly described? Q3: Is the reference standard likely to correctly classify the target condition? Q4: Is the time period between

reference standard and index test short enough to be reasonably sure that the target condition did not change between the two tests? Q5: Did the whole sample or a random selection of the sample, receive verification using a reference standard? Q6: Did patients receive the same reference standard regardless of the index test result? Q7: Was the reference standard independent of the index test (i.e., the index test did not form part of the reference standard)? Q8: Was the execution of the index test described in sufficient detail to permit replication of the test? Q9: Was the execution of the reference standard described in sufficient detail to permit its replication? Q10: Were the index test results interpreted without knowledge of the results of the reference standard? Q11: Were the reference standard results interpreted without knowledge of the results of the index test? Q12: Were the same clinical data available when test results were interpreted as would be available when the test is used in practice? †Y = yes, N = no, U = unknown. ‡Total number of questions with a Yes answer/total number of questions with a No or Unknown answer.

TABLE E-3 Definitions of Cutoffs of Used Tests in All Included Studies*

Title	WBC	ESR	CRP	IL-6
Chevillotte et al., 2009	>10.500 × 10^9/L	ROC-derived	ROC-derived	ND
Schinsky et al., 2008	ND	>30 mm/hr	>10 mg/dL	ND
Pfitzner et al., 2008	ND	ND	>0.5 mg/dL	ND
Müller et al., 2008	>12.000 × 10^9/L	ND	>0.5 mg/dL	ND
Kanner et al., 2008	ND	ND	NS	ND
Ghanem et al., 2008	ROC-derived	ROC-derived	ROC-derived	ND
Fuster et al., 2008	ND	>15 mm/hr	>0.8 mg/dL	ND
Fink et al., 2008	ND	ND	>13.5 mg/dL	ND
Austin et al., 2008	ND	>30 mm/hr	>10 mg/L	>10-12 ng/L
Simonsen et al., 2007	>9.000 × 10^9/L	>40 mm/hr	>10 mg/L	ND
Nilsdotter-Augustinsson et al., 2007	>11.000 × 10^9/L	>30 mm/hr	>10 mg/L	ND
Greidanus et al., 2007	ND	>30 mm/hr	>10 mg/L	ND
Della Valle et al., 2007	ND	>30 mm/hr	>10 mg/dL	ND
Bottner et al., 2007	ROC-derived	ROC-derived	ROC-derived	ROC-derived
Baré et al., 2006	ND	>30 mm/hr	>10 mg/L	ND
Di Cesare et al., 2005	≥11.000 × 10^9/L	≥30 mm/hr	≥10 mg/L	≥10 pg/mL
Savarino et al., 2004	ROC-derived	ROC-derived	ROC-derived	ND
Bernard et al., 2004	>6.000 × 10^9/L	≥30 mm/hr	≥10 mg/L	ND
Itasaka et al., 2001	≥9.000 × 10^9/L	≥30 mm/hr	≥0.3 mg/dL	ND
Teller et al., 2000	ND	>40 mm/hr	ND	ND
Spangehl et al., 1999	>11.000 × 10^9/L	>30 mm/hr	>10 mg/L	ND
Lachiewicz et al., 1996	NS	NS	ND	ND
Duff et al., 1996	ND	NS	ND	ND
Roberts et al., 1992	ND	>30 mm/hr	ND	ND
Thorén and Wigren, 1991	ND	>35 mm/hr	ND	ND
Levitsky et al., 1991	ND	≥30 mm/hr	ND	ND
Sanzén and Carlsson, 1989	ND	NS	≥10 mg/L	ND
Magnuson et al., 1988	≥11.000 × 10^9/L	>22 mm/hr	ND	ND
Kordelle et al., 2004	>10.000 × 10^9/L	ND	≥5 mg/dL	ND
Klett et al., 2001	≥11.300 × 10^9/L	>15 to 30 mm/hr†	≥5 mg/L	ND

*WBC = white blood-cell count, ESR = erythrocyte sedimentation rate, Def = definition, CRP = C-reactive protein level, IL-6 = interleukin-6, ND = not done, ROC = receiver operator curve, and NS = done but not specified. †Definition varied based on age and sex.

TABLE E-4 Pooled Sensitivity, Specificity, Positive Likelihood Ratio, Negative Likelihood Ratio, and Diagnostic Odds Ratio and Assessment of Peripheral White Blood-Cell Count as a Diagnostic Marker for Prosthetic Joint Infection

Population	N	Sensitivity* *(%)*	Specificity* *(%)*	Positive Likelihood Ratio*	Negative Likelihood Ratio*	Diagnostic Odds Ratio*
All	15	45 (41 - 49) (88)	87 (85 - 89) (88)	2.6 (1.8 - 3.7) (64)	0.74 (0.6 - 0.9) (81)	4.6 (3 - 6.8) (27)
Site of the prosthesis						
Total hip arthroplasty	7	33 (26 - 41) (86)	87 (85 - 90) (90)	2.1 (1.4 - 3.3) (47)	0.84 (0.7 - 0.9) (0)	3.4 (2 - 5.6) (0)†
Total knee arthroplasty	3	51 (44 - 58) (92)	88 (83 - 91) (71)	3.8 (2.4 - 6.1) (11)	0.7 (0.4 - 1.2) (94)	5.8 (2 - 16.5) (48)
Receiver operator characteristic curve used						
Yes	3	65 (57 - 71) (78)	78 (73 - 83) (93)	2.1 (1 - 4.8) (92)	0.46 (0.38 - 0.56) (0)	6.4 (4.3 - 12.7) (12)‡
No	12	41 (36 - 45) (88)	89 (87 - 91) (88)	2.7 (1.7 - 4.3) (57)	0.8 (0.7 - 0.88) (53)	4.1 (2.7 - 6.3) (0)
Cohort representative						
Yes	12	53 (49 - 57) (90)	88 (86 - 91) (87)	3.1 (1.9 - 4.9) (70)	0.64 (0.5 - 0.81) (87)	7 (4.9 - 10.2) (5)†
No	3	28 (19 - 38) (86)	83 (78 - 87) (91)	1.8 (1.2 - 2.6) (0)	0.86 (0.76 - 0.97) (6)	2.5 (1.3 - 4.8) (0)
Based on prosthetic joint infection definition (>1 periprosthetic culture or sinus tract)						
Yes	4	45 (38 - 51) (94)	89 (86 - 91) (82)	3.3 (1.8 - 5.8) (45)	0.7 (0.5 - 1.1) (93)	4.6 (1.9 - 11.4) (64)‡
No	11	46 (41 - 51) (87)	85 (81 - 88) (90)	2.3 (1.5 - 3.4) (52)	0.73 (0.6 - 0.9) (62)	4.2 (2.65 - 6.6) (0)

*The 95% confidence interval and the I^2 value (in percent) are given in parentheses. †$P \leq 0.05$. ‡$P > 0.05$.

TABLE E-5 Pooled Sensitivity, Specificity, Positive Likelihood Ratio, Negative Likelihood Ratio, and Diagnostic Odds Ratio and Assessment of Erythrocyte Sedimentation Rate Count as a Diagnostic Marker for Prosthetic Joint Infection

Population	N	Sensitivity* *(%)*	Specificity* *(%)*	Positive Likelihood Ratio*	Negative Likelihood Ratio*	Diagnostic Odds Ratio*
All	25	75 (72 - 77) (88)	70 (68 - 72) (95)	2.6 (1.9 - 3.4) (91)	0.37 (0.25 - 0.55) (93)	8 (4.7 - 13.8) (81)
Site of the prosthesis						
Total hip arthroplasty	10	76 (70 - 82) (73)	61 (57 - 65) (96)	2.4 (1.6 - 3.6) (91)	0.37 (0.23 - 0.6) (64)	6.6 (2.4 - 18.1) (80)†
Total knee arthroplasty	7	72 (68 - 76) (95)	77 (74 - 80) (96)	3.4 (1.7 - 6.8) (96)	0.29 (0.1 - 0.8) (98)	13.7 (4.5 - 41.6) (90)
Receiver operator characteristic curve used						
Yes	4	78 (72 - 83) (0)	90 (87 - 93) (0)	7.7 (5.7 - 10.4) (0)	0.26 (0.2 - 0.32) (0)	34 (21 - 53.9) (0)‡
No	21	74 (71 - 77) (90)	65 (62 - 67) (95)	2.2 (1.7 - 2.8) (88)	0.39 (0.26 - 0.59) (92)	6.7 (3.8 - 11.77) (77)
Cohort representative						
Yes	20	77 (74 - 80) (89)	71 (69 - 73) (94)	2.8 (2.1 - 3.9) (92)	0.31 (0.18 - 0.51) (95)	10.9 (6.2 - 19.1) (77)‡
No	5	60 (51 - 68) (75)	65 (59 - 70) (98)	1.8 (0.8 - 4) (91)	0.65 (0.35 - 1.2) (81)	2.1 (0.5 - 9.7) (87)
Based on prosthetic joint infection definition (>1 periprosthetic culture or sinus tract)						
Yes	9	67 (63 - 72) (92)	75 (72 - 78) (97)	3.3 (1.6 - 6.5) (95)	0.4 (0.2 - 0.9) (97)	7.8 (2.5 - 24.5) (91)†
No	16	81 (77 - 84) (81)	65 (62 - 98) (92)	2.3 (1.7 - 2.95) (86)	0.34 (0.23 - 0.52) (81)	8 (4.6 - 14.1) (67)

*The 95% confidence interval and the I^2 value (in percent) are given in parentheses. †$P > 0.05$. ‡$P \leq 0.05$.

TABLE E-6 Pooled Sensitivity, Specificity, Positive Likelihood Ratio, Negative Likelihood Ratio, and Diagnostic Odds Ratio and Assessment of Plasma C-Reactive Protein Level as a Diagnostic Marker for Prosthetic Joint Infection

Population	N	Sensitivity* *(%)*	Specificity* *(%)*	Positive Likelihood Ratio*	Negative Likelihood Ratio*	Diagnostic Odds Ratio*
All	23	88 (86 - 90) (84)	74 (71 - 76) (91)	3.3 (2.4 - 4.6) (93)	0.16 (0.1 - 0.26) (85)	24.4 (12.76 - 47.48) (82)
Site of the prosthesis						
Total hip arthroplasty	10	91 (87 - 95) (31)	68 (65 - 71) (92)	3 (1.9 - 4.7) (93)	0.18 (0.01 - 0.3) (32)	18.9 (8.1 - .43.8) (60)†
Total knee arthroplasty	7	84 (81 - 87) (31)	79 (75 - 81) (90)	3.7 (2.2 - 6.3) (93)	0.15 (0.07 - 0.36) (92)	27.6 (7.7 - 98) (92)
Receiver operator characteristic curve used						
Yes	4	86 (80 - 90) (51)	82 (78 - 86) (83)	4.5 (2.3 - 8.8) (82)	0.16 (0.07 - 0.4) (59)	34 (7.9 - 147) (77)†
No	19	89 (87 - 91) (86)	71 (69 - 74) (92)	3.1 (2.2 - 4.4) (93)	0.16 (0.09 - 0.327) (86)	23 (10.4 - 50.3) (83)
Cohort representative						
Yes	20	89 (87 - 91) (85)	78 (76 - 80) (87)	3.7 (2.7 - 5.1) (86)	0.14 (0.08 - 0.24) (87)	30.5 (14 - 66.5) (84)‡
No	3	81 (71 - 88) (57)	59 (53 - 64) (96)	1.9 (1 - 3.9) (95)	0.34 (0.2 - 0.5) (0)	7.1 (3.6 - 14.2) (14)
Based on prosthetic joint infection definition (>1 periprosthetic culture or sinus tract)						
Yes	10	82 (78 - 85) (82)	75 (72 - 77) (90)	3.8 (2.5 - 5.7) (89)	0.2 (0.1 - 0.35) (84)	20.7 (8.4 - 51.2) (85.4)†
No	13	93 (90 - 95) (79)	74 (71 - 77) (93)	3.4 (1.9 - 6.1) (95)	0.14 (0.06 – 0.33) (86)	26.1 (9.1 - 74.4) (80)

*The 95% confidence interval and the I^2 value (in percent) are given in parentheses. †$P > 0.05$. ‡$P \leq 0.05$.

TABLE E-7 Sensitivity Analysis Assessment of Peripheral Blood White Blood-Cell Count, Erythrocyte Sedimentation Rate, C-Reactive Protein Level, and Interleukin-6 and Combination of Erythrocyte Sedimentation Rate and C-Reactive Protein Level as Diagnostic Markers for Prosthetic Joint Infection

Inflammation Markers	Sensitivity*	Specificity*	Diagnostic Odds Ratio*
White blood-cell count	0.35 (0.22 - 0.50)	0.89 (0.81 - 0.94)	4.36 (2.90 - 6.59)
Erythrocyte sedimentation rate	0.74 (0.71 - 0.77)	0.72 (0.63 - 0.79)	7.15 (4.68 - 10.94)
C-reactive protein	0.64 (0.52 - 0.74)	0.92 (0.77 - 0.97)	13.09 (7.88 - 21.74)
Interleukin-6	0.97 (0.93 - 0.99)	0.91 (0.87 - 0.94)	314.69 (112.95 - 876.82)
Erythrocyte sedimentation rate or C-reactive protein	0.93 (0.80 - 0.98)	0.75 (0.54 - 0.89)	38.29 (18.94 - 77.39)
Erythrocyte sedimentation rate and C-reactive protein	0.87 (0.74 - 0.94)	0.93 (0.90 - 0.96)	89.21 (38.90 - 204.61)

*The values are given as the mean, with the 95% confidence interval in parentheses.