TABLE E-1 Clinical Studies Comparing All-Polyethylene and Metal-Backed Tibial Implants in Total Knee Arthroplasty*

Authors/Year	Study Methodology/Population	Mean Age (Range) *(yr)*	Implants	Mean Duration of Follow-up (Range)	Revisions	Outcomes
Apel et al., 1991[8]	Matched-pair study of 118 patients with 131 TKA (62 APT and 69 MBT; 13 bilateral cases had APT on one side and MBT on other side). APT group had larger proportion of patients with rheumatoid arthritis	APT: 61.5 (26-81), MBT: 65.3 (32-85)	Total condylar prosthesis (implants not specified)	APT: 90.4 mo (48-137), MBT: 69.2 mo (48-96)	0 for mechanical loosening; 2 for infection	NSD in HSS scores or radiographic outcomes
L'Insalata et al., 1992[102]	38 APT in 28 patients and 60 MBT in 45 patients	82 (80-90)	APT: 21 total condylar and 17 PS; MBT: 52 PS, 4 cruciate condylar, 3 kinematic, 1 constrained condylar (implants not specified)	MBT: 4 yr (2-8), APT: 5 yr (2-12)	0 for mechanical loosening; 3 (1 APT and 2 MBT) for infection	NSD in survival (97%)
Rand, 1993[103]	22 APT in 17 patients and 56 MBT in 46 patients	APT: 58 (27-71), MBT: 64 (26-78)	CR total condylar prosthesis (Howmedica, Rutherford, NJ)	APT: 10 yr (8-11), MBT: 10 yr (8-11.5)	Survivorship at 10 yr: 96% in both groups with end point of revision; 85% for MBT and 92% for APT with end point of revision or poor knee score; 85% for MBT and 90% for APT with end point of revision, poor knee score, or radiographic failure	NSD in HSS scores, radiographic outcomes, or survival
Pomeroy et al., 2000[92]	298 APT in 231 patients compared with a matched group of MBT	75 (61-94)	PFC Sigma CR (DePuy J&J, Warsaw, IN)	35.3 mo (24-84)	0 for aseptic loosening or osteolysis; 3 for infection	NSD in KSS, HSS scores, or SF-36 scores
Udomkiat et al., 2001[14]	Matched-pair study of 48 APT and 48 MBT (96 knees)	APT: 70.3 (41-83), MBT: 70.7 (45-87)	Apollo, CR/PS (Sulzer Medica Orthopedics, Austin, TX)	37.8 mo (24-71)	0	NSD in KSS, radiographic outcomes, or patient self-assessment
Rodriguez et al., 2001[26]	130 APT in 91 patients and 113 MBT in 84 patients	70 (27-88)	PFC PS (DePuy J&J, Warsaw, IN)	5.5 yr (5-7)	1 APT for infection; 7 MBT (1 for fracture and 6 for synovitis/osteolysis)	NSD in KSS; best-case survival at 7 yr: 96% ± 0.8% for APT and 75% ± 10% for MBT

Najibi et al., 2003[91]	Matched-pair study of 49 APT and 49 MBT (98 patients)	APT: 78.1 (59.6-91.7), MBT: 77.8 (59.8-91.6)	PFC or PFC Sigma PS (DePuy, Warsaw, IN)	APT: 6 yr (4-8), MBT: 5.3 yr (4-8)	0	NSD in KSS, HSS scores, SF-36 scores, ROM, or VAPS
Ma et al., 2005[104]	64 TKA (28 APT and 36 MBT) in 52 patients	59 (43-72)	Total condylar (Howmedica, Rutherford, NJ)	19 yr (17-22)	5 for infection; 5 (4 MBT and 1 APT) for mechanical failure; and 3 for periprosthetic fracture	20-yr survival with mechanical failure as end point: 91.9% overall (96.4% for APT and 88.4% for MBT, $p < 0.001$)
Shen et al., 2008[105]	34 APT in 31 patients and 34 MBT in 32 patients	APT: 62 (48-72), MBT: 60.4 (50-68)	PFC PS (DePuy J&J, Warsaw, IN)	5.9 yr (5-7)	1 MBT for infection	NSD in HSS scores, ROM, or radiographic outcomes. Worst-case 5-yr survival: 93.55% (95% confidence interval 84.95%-100%) for APT and 93.75% (95% confidence interval 85.35%-100%) for MBT ($p = 0.96$)

*All studies were retrospective in design. APT: all-polyethylene tibial components; MBT: metal-backed tibial components; TKA: total knee arthroplasties; HSS: Hospital for Special Surgery; KSS: Knee Society Scores; NSD: no significant difference; ROM: range of motion; VAPS: visual analogue pain score; PS: posteriorly stabilized; and CR: cruciate-retaining.