

2020 AJRR Annual Report Supplement

Data presented in this report have been submitted to the American Academy of Orthopaedic Surgeons (AAOS) American Joint Replacement Registry (AJRR) by sites through June 2020 to include procedures from 2012 to 2019. This year analyses were expanded beyond the survivorship curves into much more inclusive tables examining cumulative, all-cause revision at target timepoints with further stratification of devices based on fixation and bearing descriptions. Only patients ≥ 65 years of age with a diagnosis of osteoarthritis (OA) who underwent a primary total joint replacement or revision surgery are represented in the current analysis. Complete 2020 AJRR Annual Report Supplement and methodology available at aaos.org/AJRRannualreport.

Hip Arthroplasty Constructs by Prosthesis

The majority of the variation in the hip device-specific survivorship curves appeared to occur within one year of the primary procedure. Early failure is typically a result of infection, dislocation, or periprosthetic fracture, which may or may not be related to the implant itself. Results showed all device constructs included in analysis have a cumulative percent revision of less than 2.8% at one year and less than 4.7% at final follow-up for each respective device. Metal-on-metal hip constructs were excluded from all analyses. Cemented acetabular components did not have sufficient procedure volume to be included in this supplement but will be included in future publications when numbers permit.

Table 1.1 Cumulative Percent Revision of Cementless Hip Arthroplasty Construct Combinations, 2012-2019

Acetabular Shell	Femoral Stem	N Total	N Revised	1 Yr	3 Yrs	5 Yrs	7 Yrs
Trident	Accolade II	34,477	670	1.40 (1.28, 1.53)	2.03 (1.88, 2.19)	2.37 (2.17, 2.58)	2.59 (2.32, 2.87)
Pinnacle	Corail	32,180	327	0.73 (0.64, 0.83)	1.04 (0.93, 1.16)	1.24 (1.10, 1.40)	1.26 (1.11, 1.42)
Pinnacle	Summit	21,385	325	1.25 (1.11, 1.41)	1.55 (1.39, 1.74)	1.72 (1.53, 1.92)	1.86 (1.58, 2.17)
Pinnacle	Tri-Lock	14,409	194	0.98 (0.83, 1.15)	1.34 (1.16, 1.56)	1.67 (1.42, 1.96)	2.11 (1.53, 2.85)
R3	Anthology	10,371	178	1.48 (1.26, 1.74)	1.85 (1.59, 2.14)	1.95 (1.66, 2.28)	2.07 (1.71, 2.49)
Continuum	M/L Taper	10,310	250	1.82 (1.57, 2.10)	2.46 (2.16, 2.79)	2.83 (2.47, 3.21)	2.95 (2.56, 3.38)
Pinnacle	Actis DuoFix	9,159	52	0.64 (0.48, 0.84)	0.78 (0.54, 1.08)	—	—
G7	Taperloc 133	8,063	124	1.44 (1.19, 1.73)	1.74 (1.45, 2.08)	1.80 (1.49, 2.15)	—
Trident II	Accolade II	6,569	64	1.17 (0.90, 1.50)	1.24 (0.94, 1.60)	—	—
G7	Taperloc 133 Microplasty	5,486	76	1.23 (0.96, 1.56)	1.52 (1.20, 1.89)	1.60 (1.25, 2.01)	—
R3	Synergy	5,469	133	2.07 (1.71, 2.48)	2.59 (2.18, 3.07)	2.77 (2.31, 3.30)	2.77 (2.31, 3.30)
Trilogy	M/L Taper	3,924	95	1.48 (1.14, 1.90)	2.14 (1.71, 2.66)	2.87 (2.29, 3.56)	3.82 (2.77, 5.12)
Pinnacle	S-ROM	3,339	75	1.47 (1.09, 1.93)	2.35 (1.82, 2.97)	2.92 (2.22, 3.76)	3.78 (2.68, 5.15)
R3	PolarStem	3,281	37	0.94 (0.64, 1.33)	1.35 (0.96, 1.86)	1.35 (0.96, 1.86)	—
Trident	Secur-Fit Max	2,956	72	1.64 (1.23, 2.16)	2.37 (1.85, 2.99)	2.54 (1.99, 3.19)	3.36 (2.33, 4.67)
Trident	Accolade TMZF	2,928	63	1.13 (0.79, 1.56)	1.50 (1.10, 1.99)	2.09 (1.59, 2.71)	2.69 (2.02, 3.51)
Continuum	Trabecular Metal	2,354	50	1.79 (1.31, 2.39)	2.19 (1.65, 2.86)	2.19 (1.65, 2.86)	2.19 (1.65, 2.86)
Trident	Secur-Fit	2,291	68	1.96 (1.45, 2.60)	2.95 (2.27, 3.75)	3.59 (2.79, 4.54)	—
G7	Echo Bi-Metric	2,084	22	0.89 (0.55, 1.38)	1.15 (0.73, 1.75)	1.42 (0.82, 2.32)	—
R3	Synergy HA	2,037	47	1.70 (1.20, 2.34)	2.23 (1.64, 2.96)	2.58 (1.89, 3.44)	3.03 (2.01, 4.37)
FMP	Linear	1,971	18	0.78 (0.46, 1.26)	0.93 (0.56, 1.46)	1.28 (0.64, 2.31)	—
Trident	Secur-Fit Plus Max	1,946	31	1.20 (0.78, 1.77)	1.63 (1.12, 2.30)	1.63 (1.12, 2.30)	1.84 (1.23, 2.65)
Trabecular Metal	M/L Taper	1,569	37	1.99 (1.38, 2.78)	2.38 (1.69, 3.24)	2.89 (1.81, 4.36)	2.89 (1.81, 4.36)
Mallory Head	Taperloc 133	1,381	16	0.88 (0.48, 1.50)	1.16 (0.68, 1.88)	1.37 (0.79, 2.24)	1.37 (0.79, 2.24)
Continuum	Avenir-Muller	1,245	29	1.94 (1.28, 2.84)	2.44 (1.67, 3.45)	2.44 (1.67, 3.45)	—
G7	M/L Taper	1,207	21	1.77 (1.11, 2.67)	1.91 (1.21, 2.87)	—	—
Continuum	Fitmore	1,189	33	2.20 (1.48, 3.16)	2.57 (1.77, 3.60)	2.97 (2.03, 4.19)	3.50 (2.23, 5.21)
Trilogy	VerSys	1,177	27	1.46 (0.89, 2.28)	1.96 (1.27, 2.91)	2.69 (1.79, 3.87)	2.69 (1.79, 3.87)
G7	Avenir-Muller	1,173	9	0.83 (0.41, 1.53)	0.83 (0.41, 1.53)	—	—
Trident	Citation	1,159	45	2.77 (1.93, 3.83)	3.52 (2.56, 4.72)	3.93 (2.88, 5.21)	4.67 (3.27, 6.44)
Continuum	VerSys	1,051	22	1.25 (0.70, 2.08)	2.19 (1.39, 3.27)	2.35 (1.51, 3.49)	2.35 (1.51, 3.49)
Continuum	Taperloc 133	971	13	1.15 (0.62, 2.00)	1.30 (0.71, 2.20)	1.83 (0.86, 3.47)	—
Continuum	Accolade II	957	18	1.84 (1.12, 2.87)	2.00 (1.23, 3.09)	2.00 (1.23, 3.09)	—

Knee Arthroplasty Constructs by Prosthesis

Unlike the hip device-specific survivorship curves which showed some divergence in the first year, the knee-device curves showed very little divergence for both posterior stabilized and minimally stabilized (cruciate retaining) constructs. All TKA device constructs included in analysis have a cumulative percent revision of less than 2.5% at three years and less than 3.7% at final follow-up for each respective device. Cementless TKA constructs did not have sufficient procedure volume to be included in this supplement but will be included in future publications when numbers permit.

Table 2.1 Cumulative Percent Revision of Cemented Knee Arthroplasty Construct Combinations, 2012-2019

Femoral Component	Tibial Component	N Total	N Revised	1 Yr	3 Yrs	5 Yrs	7 Yrs
Triathlon CR	Triathlon	47,829	497	0.65 (0.58, 0.73)	1.14 (1.04, 1.26)	1.39 (1.26, 1.53)	1.70 (1.44, 1.99)
Triathlon PS	Triathlon	45,342	634	0.79 (0.71, 0.88)	1.46 (1.35, 1.59)	1.82 (1.67, 1.98)	2.01 (1.80, 2.24)
Persona PS	Persona	44,586	607	0.74 (0.67, 0.83)	1.52 (1.40, 1.66)	2.17 (1.95, 2.39)	2.21 (1.98, 2.45)
Attune PS	Attune	37,719	532	0.69 (0.61, 0.78)	1.55 (1.41, 1.70)	2.06 (1.86, 2.28)	2.85 (2.09, 3.79)
Persona CR	Persona	33,086	305	0.54 (0.47, 0.63)	1.14 (1.01, 1.28)	1.35 (1.18, 1.53)	—
Vanguard CR	Maxim	20,932	330	0.62 (0.53, 0.74)	1.14 (0.99, 1.30)	1.46 (1.27, 1.69)	1.50 (1.29, 1.74)
Genesis II PS	Genesis II	22,957	244	0.84 (0.72, 0.97)	1.74 (1.55, 1.95)	2.08 (1.85, 2.33)	2.30 (1.97, 2.68)
Attune CR	Attune	17,426	164	0.52 (0.42, 0.64)	1.08 (0.91, 1.27)	1.40 (1.16, 1.66)	1.58 (1.25, 1.97)
Sigma CR	PFC Sigma	16,574	149	0.45 (0.36, 0.57)	0.82 (0.68, 0.98)	1.16 (0.97, 1.38)	1.32 (1.09, 1.59)
Sigma PS	PFC Sigma	15,395	199	0.67 (0.55, 0.81)	1.28 (0.10, 1.48)	1.53 (1.32, 1.77)	1.82 (1.55, 2.13)
NexGen LPS-Flex PS	NexGen	13,054	198	0.72 (0.58, 0.87)	1.38 (1.18, 1.60)	1.87 (1.61, 2.16)	2.03 (1.73, 2.37)
Journey II PS	Journey II	11,784	219	1.22 (1.03, 1.44)	2.26 (1.96, 2.60)	2.82 (2.33, 3.38)	3.03 (2.41, 3.74)
Vanguard PS	Maxim	11,414	194	0.95 (0.78, 1.14)	1.72 (1.48, 2.00)	2.18 (1.87, 2.53)	2.43 (2.02, 2.90)
Genesis II CR	Genesis II	9,832	113	0.69 (0.54, 0.87)	1.24 (1.01, 1.50)	1.48 (1.20, 1.79)	1.75 (1.32, 2.28)
Legion PS	Genesis II	9,783	132	0.77 (0.61, 0.96)	1.38 (1.14, 1.65)	1.94 (1.58, 2.34)	3.60 (1.43, 7.42)
Sigma PS	MBT	6,715	110	0.63 (0.46, 0.85)	1.38 (1.11, 1.71)	2.04 (1.66, 2.47)	2.45 (1.96, 3.01)
Natural-Knee II GS CR	Natural-Knee II	5,223	54	0.50 (0.33, 0.73)	0.96 (0.71, 1.28)	1.35 (1.01, 1.78)	1.61 (1.06, 2.36)
Legion CR	Genesis II	3,961	70	0.65 (0.43, 0.95)	1.50 (1.09, 2.02)	1.65 (1.20, 2.22)	1.65 (1.20, 2.22)
Evolution MP PS	Evolution MP	3,890	46	0.81 (0.56, 1.14)	1.62 (1.23, 2.10)	2.39 (1.84, 3.05)	2.99 (2.05, 4.21)
NexGen CR-Flex CR	NexGen	3,729	39	0.46 (0.28, 0.73)	0.94 (0.65, 1.31)	1.29 (0.91, 1.77)	1.39 (0.97, 1.93)
Apex Knee CR	Apex Knee	3,156	36	0.71 (0.45, 1.07)	1.59 (1.09, 2.25)	1.74 (1.18, 2.48)	—
Sigma CR	MBT	2,500	41	0.77 (0.48, 1.18)	1.42 (0.99, 1.97)	2.10 (1.49, 2.87)	2.10 (1.49, 2.87)
GMK Sphere CR	GMK Primary	1,895	18	0.80 (0.45, 1.34)	1.41 (0.77, 2.39)	1.84 (0.93, 3.29)	—
NexGen CR-Flex CR	NexGen Pegged	1,538	16	0.54 (0.26, 1.03)	1.16 (0.69, 1.84)	1.16 (0.69, 1.84)	1.16 (0.69, 1.84)
NexGen LPS-Flex GS PS	NexGen	1,217	24	0.85 (0.44, 1.51)	1.59 (0.98, 2.46)	2.09 (1.34, 3.11)	2.64 (1.65, 4.00)
Optetrak Logic PS	Optetrak Logic	1,174	15	0.61 (0.28, 1.22)	1.23 (0.69, 2.05)	1.80 (0.97, 3.07)	1.80 (0.97, 3.07)
LCS Complete CR	MBT	1,097	14	0.56 (0.24, 1.18)	0.99 (0.51, 1.76)	1.57 (0.85, 2.68)	1.95 (1.02, 3.39)
NexGen CR	NexGen	854	8	0.35 (0.10, 0.99)	0.65 (0.25, 1.47)	1.06 (0.46, 2.14)	1.51 (0.63, 3.11)