UNITED ORTHOPEDIC®

Conformity™ Stem

Femoral Hip System

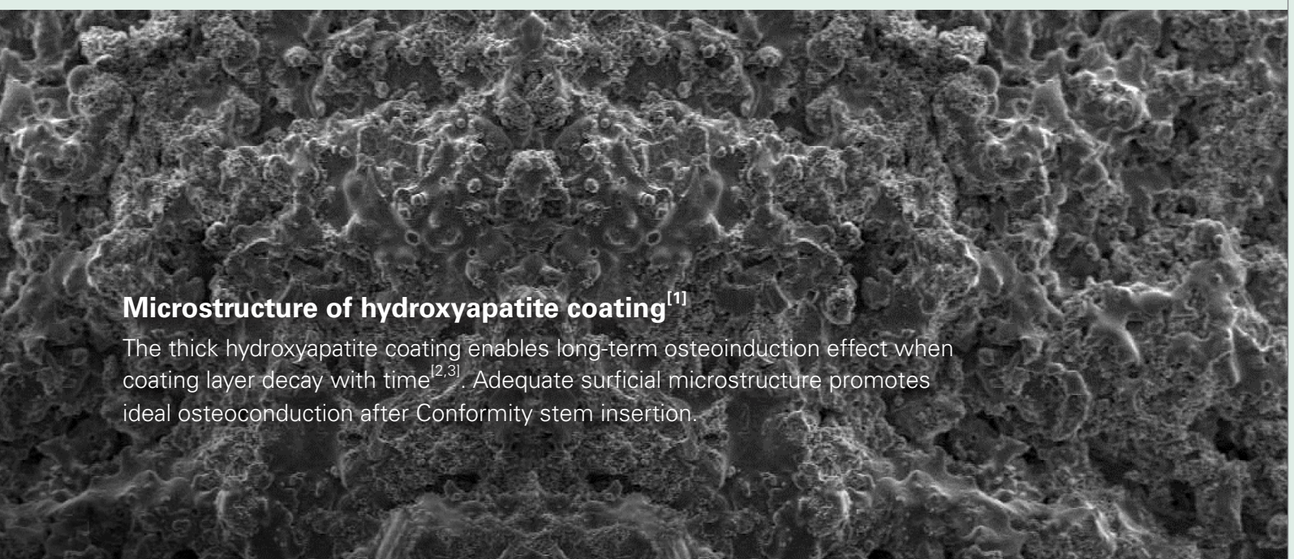
Conformity Stem –

The Conformity Stem platform provides a comprehensive stem solution to hip arthroplasty surgery. Following the classic concept of a fully-hydroxyapatite (HA) coating on the stem, multiple neck options, collared and collarless features, cementless and cemented options are available for surgeons to offer various solutions for clinical situations, and to provide the implant that best meets the patient's needs. Optimized dimensional parameters are applied to the stem design to maximize the biomechanical advantages and the facilitate of minimal invasive surgery.

The Philosophy of Cancellous Bone Compaction

The fully-HA coated femoral stem is a classic design to maximize biological fixation. Despite of cortex engagement (taper stem) or canal fitting (cylindrical stem) technique, the Conformity Stem obeys the concept of cancellous bone compaction to preserve bioactive cancellous bone layer.

The design of broaching rasp is the key to preservation of cancellous bone. The broaching rasp of the Conformity Stem follows the cancellous bone compaction concept with blunt, rib-type teeth which minimize cancellous bone extraction during femoral canal preparation.



Microstructure of hydroxyapatite coating[1]

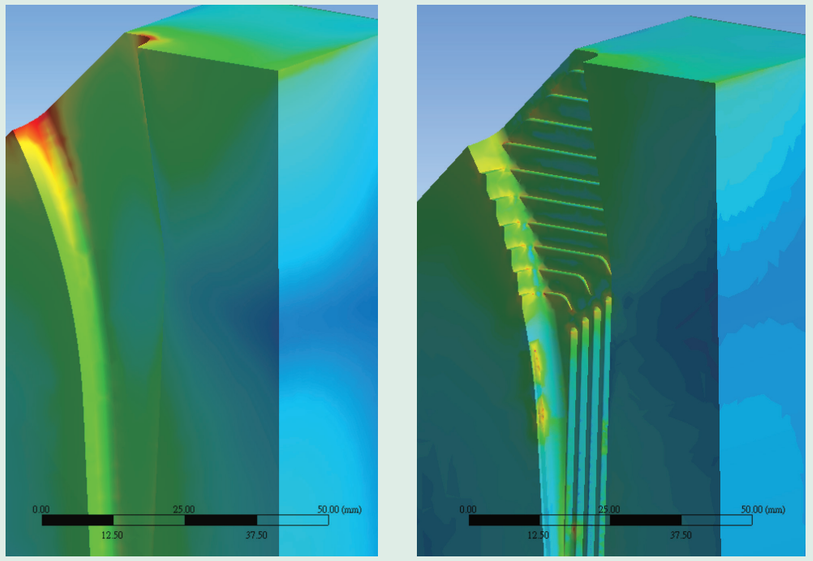
The thick hydroxyapatite coating enables long-term osteoinduction effect when coating layer decay with time[2,3]. Adequate surficial microstructure promotes ideal osteoconduction after Conformity stem insertion.

The converted compressive stress can also play an important role, the mechanical stimulants, for bone remodeling[4].

The ideal biomechanical environment and sufficient osteointegration by hydroxyapatite coating make optimal solution to an efficient and stable femoral stem implantation.

Structural Stability and Biomechanical Advantage

The medial step and horizontal grooves on the anterior-posterior proximal region of the Conformity Stem enable axial support against compressive load from the femoral head. By engaging the host bone with medial steps, the Conformity Stem is designed to reduce the possible hoop stress on peripheral bony structure to avoid the femoral fracture during stem impaction.



Axial stability: the von Mises stress on bony structure comparison between press-fit and step support techniques[5].

Conform to Reality

Reasonable Offset & Neck Length

Basing on anthropometric studies, the femoral head offset ranges for Conformity Stem series are 36.0~43.5 mm (standard) and 43.0~50.5 mm (high offset / coxa vara). A even greater offset can be adjusted by using femoral head component with larger neck offset values. For smaller sized patients, shorter femoral head offset can be achieved by applying short neck stems (31.0~32.5 mm).

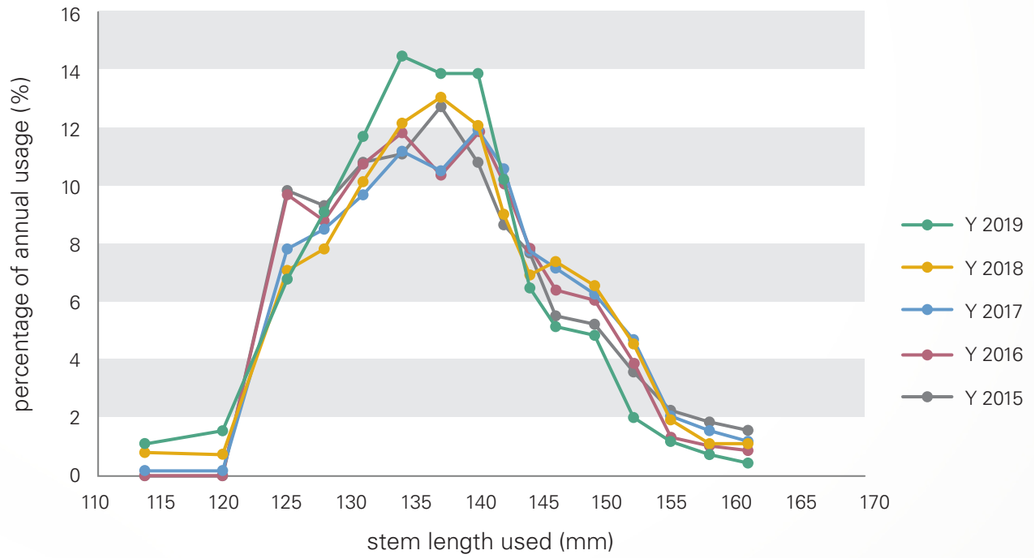
For fulfilling the femoral offset demand in anatomic perspective, reasonable stem length assignment is critical in clinical practice. The ideal definition to neck lengths of Conformity Stem system are :
Standard : 35.5 mm
High Offset : 40.5 mm
Coxa Vara : 37.5 mm
Short Neck : 28.5 mm

Study	Subject #	Database/Population	Head Offset (mm)	Range (mm)
Carmona et al. (2019)[6]	628	SOMA	40.6 / 44.3 (female/male)	–
de Sousa et al. (2010)[7]	110	Brazil	42.0 / 42.6 (left/right)	28.5~65.0
Siwach (2018)[8]	1,501	India	38	29~47
Rubin et al. (1992)[9]	32	Caucasian	47	33.2~62.8
Noble et al. (1988)[10]	200	Caucasian	43	23.6~61
Rawal et al. (2012)[11]	98	India	37.4 / 42.83 (female/male)	32~54
Husmann et al. (1997)[12]	310	France	40.5	23.4~60.8
Conformity Stem			**43.25 (mid of range)**	**28.9~57.6***

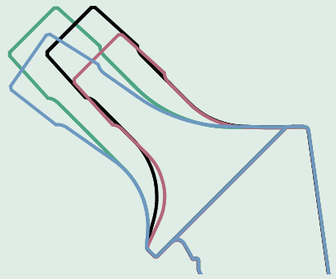
range defined by U2 femoral head offset from -3 to +10 mm

Evidence-based Stem Length

Adequate stem length is important for implant stability. However, if the stem length is too long, higher incidence periprosthetic fracture and thigh pain may reduce the quality of postoperative outcome[13].



The successful experience of UTF Reduced Stem of United represents a normal distribution of stem length required in clinical practice[14]. The stem lengths assigned in Conformity Stem series (115~160 mm) can fulfill the major anatomical demand from various patients.



4 Options for Neck Restoration

- ● Standard ● High Offset ● Coxa Vara ● Short Neck

Collared / Collarless Options

- Allows surgeon preference to meet patient's needs

Medial Step Feature

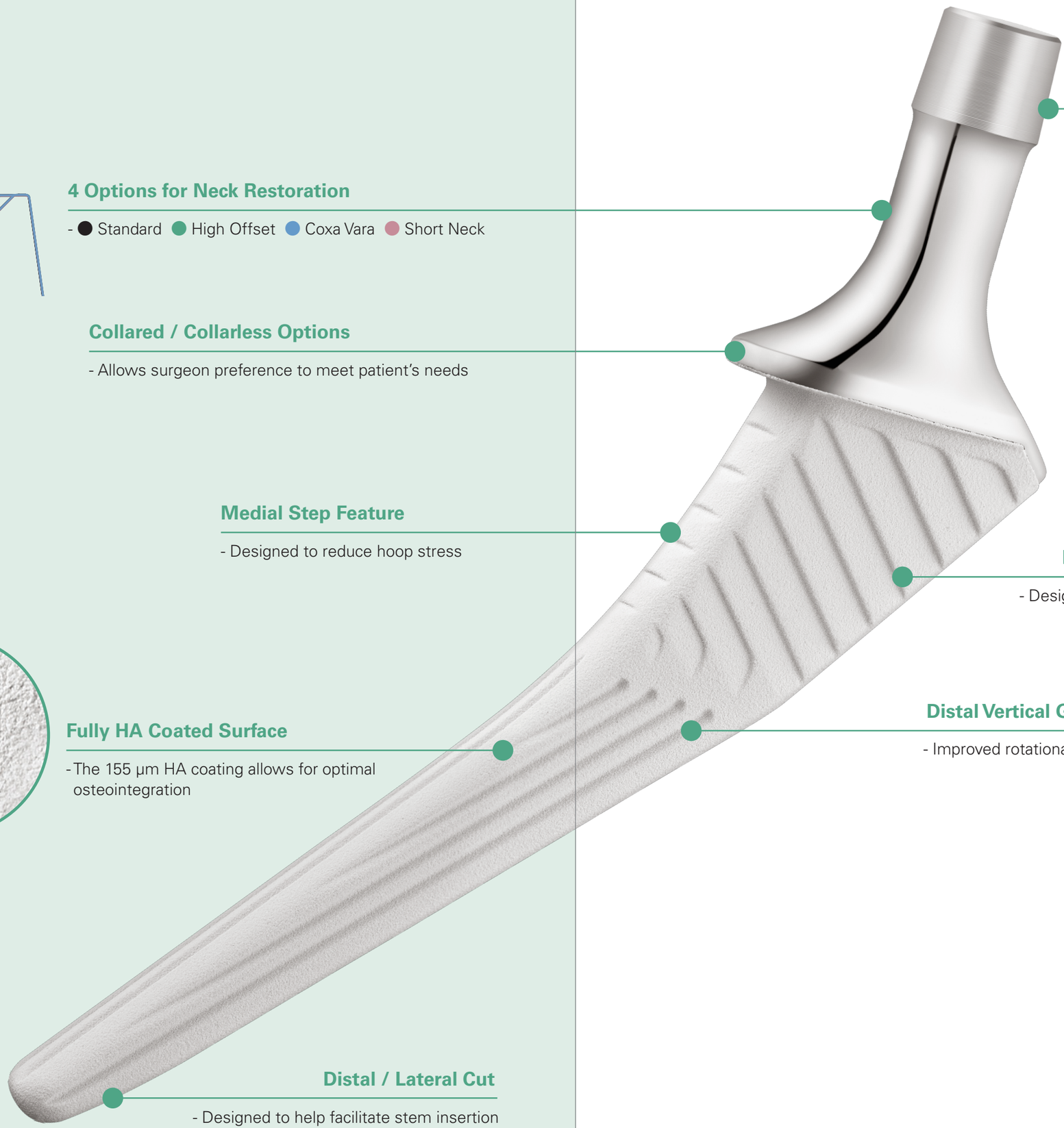
- Designed to reduce hoop stress

Fully HA Coated Surface

- The 155 µm HA coating allows for optimal osteointegration

Distal / Lateral Cut

- Designed to help facilitate stem insertion



12/14 Neck Taper

- Accommodates a complete selection of femoral heads

Proximal Horizontal Grooves

- Designed to help avoid stem subsidence

Distal Vertical Grooves

- Improved rotational stability

Multiple Options Fulfilling Multiple Demands

Basic stem design with standard and high offset options enable the surgeon to finely adjust the soft tissue tension to achieve joint stability.

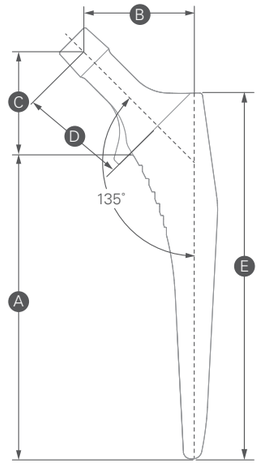
The collared hip stem structure provides support at the medial metaphysis to help avoid stem subsidence after insertion [15,16].

Offering solutions for lower neck-shaft angled or smaller sized patients with a shorter femoral neck from an anatomical perspective.

The backup solution when encountering poor bone quality, insufficient stability due to bone loss, or ambiguous canal geometry.

Order Information

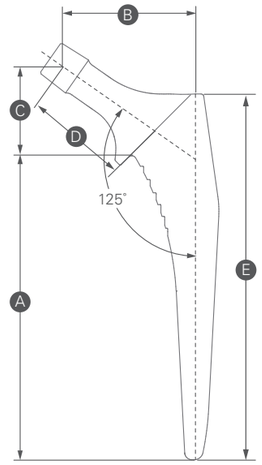
	Catalog Number		Description
Conformity, Collared			
Standard	**Standard**	**High Offset**	
	1110 - 1001	1110 - 1201	# 1
	1110 - 1002	1110 - 1202	# 2
	1110 - 1003	1110 - 1203	# 3
	1110 - 1004	1110 - 1204	# 4
	1110 - 1005	1110 - 1205	# 5
	1110 - 1006	1110 - 1206	# 6
	1110 - 1007	1110 - 1207	# 7
	1110 - 1008	1110 - 1208	# 8
	1110 - 1009	1110 - 1209	# 9
	1110 - 1010	1110 - 1210	# 10
	1110 - 1011	1110 - 1211	# 11
High Offset			
			
Conformity, Collarless			
Standard	**Standard**	**High Offset**	
	1110 - 3001	1110 - 3201	# 1
	1110 - 3002	1110 - 3202	# 2
	1110 - 3003	1110 - 3203	# 3
	1110 - 3004	1110 - 3204	# 4
	1110 - 3005	1110 - 3205	# 5
	1110 - 3006	1110 - 3206	# 6
	1110 - 3007	1110 - 3207	# 7
	1110 - 3008	1110 - 3208	# 8
	1110 - 3009	1110 - 3209	# 9
	1110 - 3010	1110 - 3210	# 10
	1110 - 3011	1110 - 3211	# 11
High Offset			
			
Conformity, Coxa Vara	**Coxa Vara**		
	1110 - 5202		# 2
	1110 - 5203		# 3
	1110 - 5204		# 4
	1110 - 5205		# 5
	1110 - 5206		# 6
	1110 - 5207		# 7
	1110 - 5208		# 8
	1110 - 5209		# 9
	1110 - 5210		# 10
	1110 - 5211		# 11
Conformity, Short Neck	**Short Neck**		
	1110 - 1401		# 1
	1110 - 1402		# 2
	1110 - 1403		# 3



Collared & Collarless

Size	A Medial Length	B Offset		C Vertical Height	D Neck Length		E Lateral Length
		Standard	High Offset		Standard	High Offset	
#1	95	36	43	34	35.5	40.5	115
#2	99.5	36.5	43.5	34	35.5	40.5	119.5
#3	104	37.5	44.5	34	35.5	40.5	124
#4	108.5	38	45	34	35.5	40.5	128.5
#5	113	39	46	34	35.5	40.5	133
#6	117.5	39.2	46.5	34	35.5	40.5	137.5
#7	122	40	47	34	35.5	40.5	142
#8	126.5	41	48	34	35.5	40.5	146.5
#9	131	41.5	48.5	34	35.5	40.5	151
#10	135.5	42.5	49.5	34	35.5	40.5	155.5
#11	140	43.5	50.5	34	35.5	40.5	160

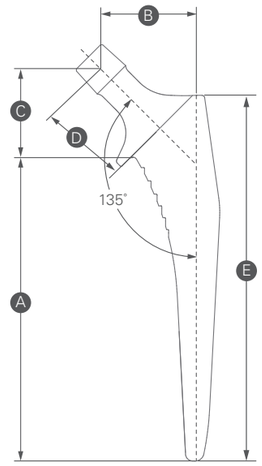
Unit: mm



Coxa Vara

Size	A Medial Length	B Offset	C Vertical Height	D Neck Length	E Lateral Length
#2	99.5	43.5	29	37.5	119.5
#3	104	44.5	29	37.5	124
#4	108.5	45	29	37.5	128.5
#5	113	46	29	37.5	133
#6	117.5	46.5	29	37.5	137.5
#7	122	47	29	37.5	142
#8	126.5	48	29	37.5	146.5
#9	131	48.5	29	37.5	151
#10	135.5	49.5	29	37.5	155.5
#11	140	50.5	29	37.5	160

Unit: mm



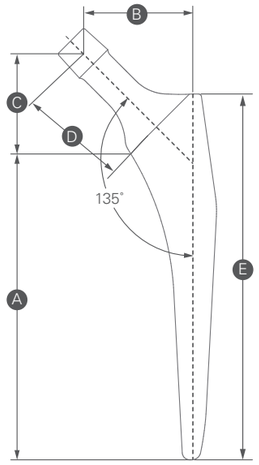
Short Neck

Size	A Medial Length	B Offset	C Vertical Height	D Neck Length	E Lateral Length
#1	95	31	29	28.5	115
#2	99.5	31.5	29	28.5	119.5
#3	104	32.5	29	28.5	124

Unit: mm

Order Information

	Catalog Number		Description
Conformity, Cemented			
Standard	**Standard**	**High Offset**	
	1110 - 7001	1110 - 7201	# 1
	1110 - 7002	1110 - 7202	# 2
	1110 - 7003	1110 - 7203	# 3
	1110 - 7004	1110 - 7204	# 4
	1110 - 7005	1110 - 7205	# 5
	1110 - 7006	1110 - 7206	# 6
	1110 - 7007	1110 - 7207	# 7
	1110 - 7008	1110 - 7208	# 8
	1110 - 7009	1110 - 7209	# 9
	1110 - 7010	1110 - 7210	# 10
High Offset			
			



Size	A Medial Length	B Offset		C Vertical Height	D Neck Length		E Lateral Length
		Standard	High Offset		Standard	High Offset	
#1	95	36	43	34	35.5	40.5	115
#2	99.5	36.5	43.5	34	35.5	40.5	119.5
#3	104	37.5	44.5	34	35.5	40.5	124
#4	108.5	38	45	34	35.5	40.5	128.5
#5	113	39	46	34	35.5	40.5	133
#6	117.5	39.2	46.5	34	35.5	40.5	137.5
#7	122	40	47	34	35.5	40.5	142
#8	126.5	41	48	34	35.5	40.5	146.5
#9	131	41.5	48.5	34	35.5	40.5	151
#10	135.5	42.5	49.5	34	35.5	40.5	155.5

Unit: mm

Reference

[1] Data held on file. United Orthopedic Corporation

[2] Does hydroxyapatite coating have no advantage over porous coating in primary total hip arthroplasty? A meta-analysis. Chen YL, Lin T, Liu A, Shi MM, Hu B, Shi ZL, Yan SG. J Orthop Surg Res. 2015 Jan 28;10:21. doi: 10.1186/s13018-015-0161-4.

[3] Hydroxyapatite coated femoral stems in primary total hip arthroplasty: a meta-analysis. Gandhi R, Davey JR, Mahomed NN. J Arthroplasty. 2009 Jan;24(1):38-42. doi: 10.1016/j.arth.2008.01.299. Epub 2008 Feb 14.

[4] The biology of normal bone remodelling. Katsimbri P. Eur J Cancer Care (Engl). 2017;26(6). doi: 10.1111/ecc.12740.

[5] Data held on file. United Orthopedic Corporation

[6] Upper Femur Anatomy Depends on Age and Gender: A Three-Dimensional Computed Tomography Comparative Bone Morphometric Analysis of 628 Healthy Patients' Hips. Carmona M, Tzioupis C, LiArno S, Faizan A, Argenson JN, Ollivier M. J Arthroplasty. 2019 Oct;34(10):2487-2493. doi: 10.1016/j.arth.2019.05.036.

[7] Morphometric Study of the Proximal Femur Extremity in Brazilians. de Sousa EB, Fernandes RMP, Mathias MB, Rodrigues MR, Ambram AJ, Babinski MA. Int. J. Morphol. 2010;28(3):835-40.

[8] Anthropometric Study of Proximal Femur Geometry and Its Clinical Application. Siwach R. Ann Natl Acad Med Sci. 2018;54(4):203-15.

[9] The morphology of the proximal femur. A three-dimensional radiographic analysis. Rubin PJ, Leyvraz PF, Aubaniac JM, Argenson JN, Estève P, de Roguin B. J Bone Joint Surg Br. 1992 Jan;74(1):28-32.

[10] The anatomic basis of femoral component design. Noble PC et al. Clin Orthop Relat Res. 1988 Oct;(235):148-65.

[11] Anthropometric measurements to design best-fit femoral stem for the Indian population. Rawal B et al. Indian J Orthop. 2012 Jan;46(1):46-53. doi: 10.4103/0019-5413.91634.

[12] Three-dimensional morphology of the proximal femur. Husmann P et al. J Arthroplasty. 1997 Jun;12(4):444-50. doi: 10.1016/s0883-5403(97)90201-1.

[13] Internal sales data of United.

[14] Occult periprosthetic femoral fractures occur frequently during a long, trapezoidal, double-tapered cementless femoral stem fixation in primary THA.Yun HH, Lim JT, Yang SH, Park PS. PLoS One. 2019 Sep 19;14(9):e0221731. doi: 10.1371/journal.pone.0221731.

[15] Compared fixation and survival of 280 lateralised vs 527 standard cementless stems after two years (1–7). Cantin O, Viste A, Desmarchelier R, Besse JL, Fessy MH. Orthop Traumatol Surg Res 2015;101:775–780.

[16] Cementless lateralized stems in primary THA: Mid-term survival and risk factors for failure in 172 stems . Courtin C, Viste A, Subtil F, Cantin O, Desmarchelier R, Fessy MH. Orthop Traumatol Surg Res 2017;103:15–19.

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