Smith+Nephew

SPECTRON◊ EF

Hip System

Surgical Technique

Table of contents

SPECTRON◊ EF
Hip System

Surgical technique completed in conjunction with

William W. Brien, M.D.
Associate Clinical Professor of Orthopaedic Surgery,
University of California at Irvine,
Irvine, California
Attending Surgeon, Cedars-Sinai Medical Center,
Los Angeles, California

J. Rod Davey, M.D., F.R.C.S.
Acting Head of Orthopaedic Surgery,
The Toronto Hospital
Assistant Professor of the Department of Surgery,
University of Toronto
Toronto, Ontario, Canada

Paul Di Cesare, M.D.
Hospital for Joint Diseases
Orthopaedic Institute
Director of Musculoskeletal Research Center
Co-Director of Surgical Arthritis Service
Assistant Professor of Orthopaedic Surgery,
New York University School of Medicine
New York, New York

Henrik Malchau, M.D., Ph.D.
Sahlgrenska University Hospital
Associate Professor
Department of Orthopaedics
Göteborg, Sweden

Nota Bene

The following technique is for informational and educational purposes only. It is not intended to serve as medical advice. It is the responsibility of treating physicians to determine and utilize the appropriate products and techniques according to their own clinical judgment for each of their patients. For more information on the product, including its indications for use, contraindications, and product safety information, please refer to the product's label and Instructions for Use.

Stem specifications

For use with Smith+Nephew 12/14 femoral heads only.

Specifications

Size	Neck angle	Distal cross section	Stem length	A-P width	M-L width
1, 1H	131°	6 mm	115 mm	12.9 mm	25.4 mm
2, 2H	131°	7 mm	125 mm	13.7 mm	27.2 mm
3, 3H	131°	8 mm	135 mm	14.5 mm	28.9 mm
4, 4H	131°	10 mm	135 mm	15.3 mm	30.7 mm
5, 5H	131°	12 mm	135 mm	16.1 mm	32.5 mm

Neck height mm

When femoral head component selected is:

Size	-3	+0	+4	+8	+12	+16
1	24	26	28	31	34	36
1H	24	26	28	31	34	36
2	26	28	30	33	36	38
2H	26	28	30	33	36	38
3	28	30	32	35	37	40
3H	28	30	32	35	37	40
4	30	32	34	37	39	42
4H	30	32	34	37	39	42
5	32	34	36	39	41	44
5H	32	34	36	39	41	44

Neck offset mm

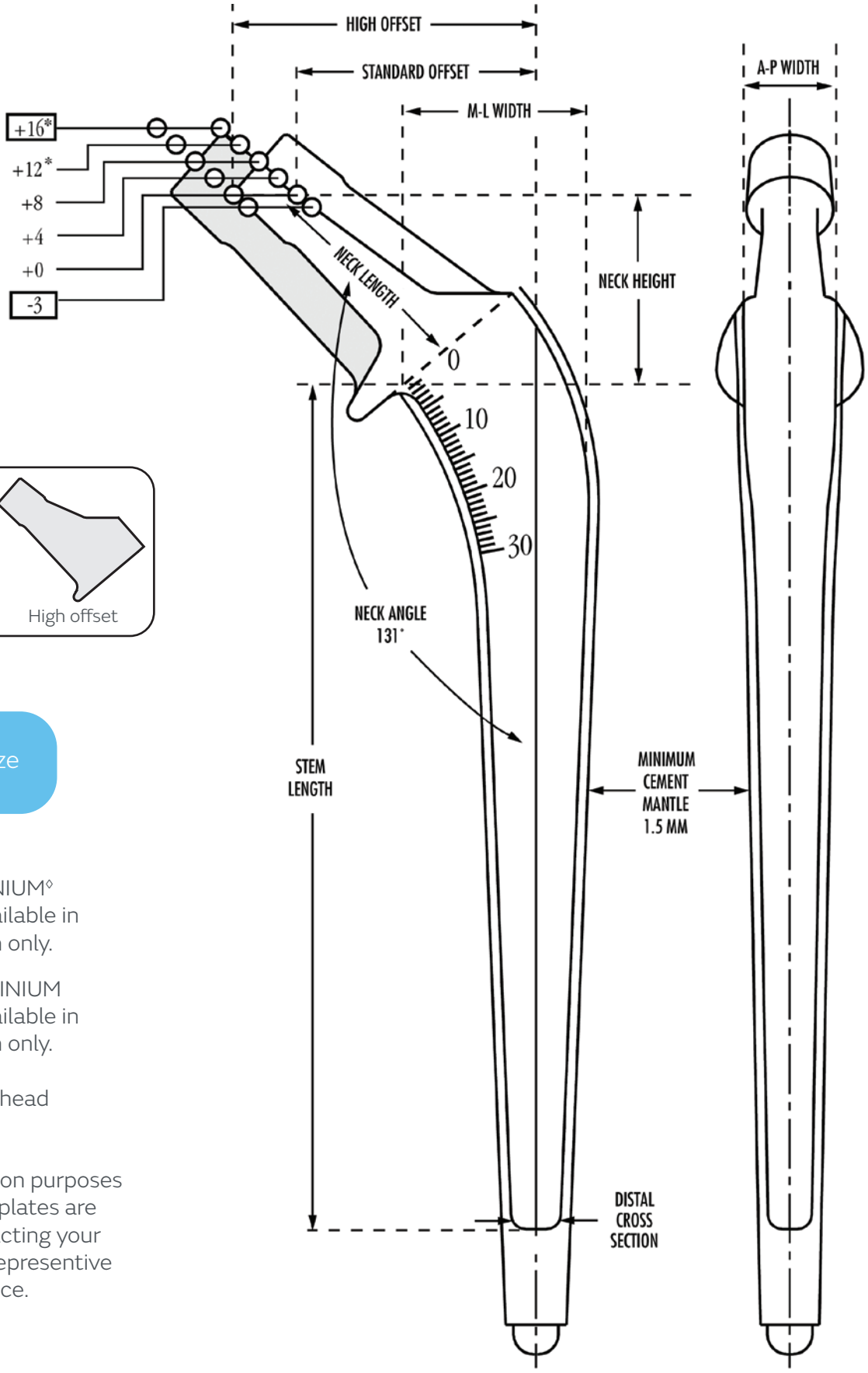
When femoral head component selected is:

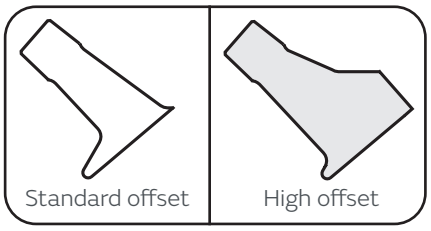
Size	-3	+0	+4	+8	+12	+16
1	32	35	38	41	44	47
1H	38	41	44	47	50	53
2	34	36	39	42	45	48
2H	42	44	47	50	53	56
3	35	38	41	44	47	50
3H	45	48	51	54	57	60
4	37	39	42	45	48	51
4H	47	49	52	55	58	61
5	38	41	44	47	50	53
5H	48	51	54	57	60	63

Neck length mm

When femoral head component selected is:

Size	-3	+0	+4	+8	+12	+16
1	27	30	34	38	42	46
1H	31	34	38	42	46	50
2	29	32	36	40	44	48
2H	34	37	41	45	49	53
3	31	34	38	42	46	50
3H	37	40	44	48	52	56
4	33	36	40	44	48	52
4H	39	42	46	50	54	58
5	35	38	42	46	50	54
5H	41	44	48	52	56	60





Not actual size

-3 CoCr and OXINIUM◊ femoral heads available in 28mm and 32mm only.

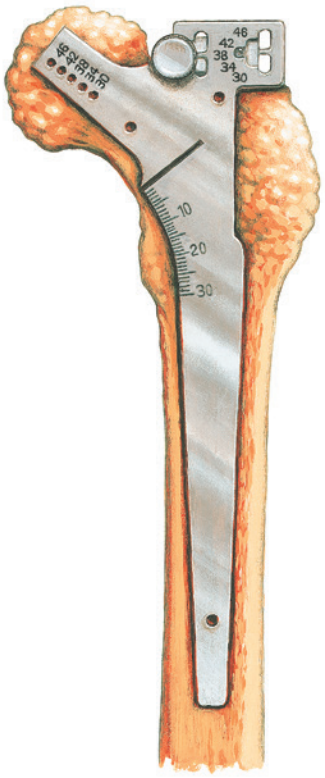
+16 CoCr and OXINIUM femoral heads available in 28mm and 32mm only.

* Denotes skirted head

Note: For illustration purposes only. Surgical Templates are available by contacting your Smith+Nephew Representive or Customer Service.

Femoral osteotomy

1. Use the osteotomy guide to determine the level of resection, using one of the following techniques:



A. Place the template over the X-ray of the hip. Determine the stem size. Determine length of femoral head to be used. A graduation scale can be found on the medial aspect of the stem on the template. Make note of how many graduations above the lesser trochanter where the osteotomy will take place, as determined by the collar of the stem.

In the O.R., place the osteotomy guide on the femur by referencing the lesser trochanter at the same graduation mark as noted during templating. Osteotomize the neck.

B. Place the template over the X-ray of the hip. Determine the stem size. Determine length of femoral head to be used. Determine the base neck length on the standard offset stem as indicated on the template. Add to this number the length of the femoral head.

In the O.R., place the greater trochanter block on the osteotomy guide at this numerical position. If the number does not match perfectly, use the lower number. Place the guide on the femur by resting the block on the top of the greater trochanter. Osteotomize the neck.

Note: When used in revision cases, existing implants should be removed from the proximal femur prior to canal preparation. In case of previously cemented stems also make best attempts to remove all cement residuals and plugs from previous intervention.

Prepare acetabulum

2. If acetabular reconstruction is required, prepare acetabulum using the technique for the intended acetabular component.

Femoral canal preparation

3. Open the medullary canal at the transected neck using the box chisel. Stay posterior and lateral in order to obtain a neutral stem position (Figure 1). Sound the femoral canal using the blunt medullary reamer (Figure 2).

Figure 1

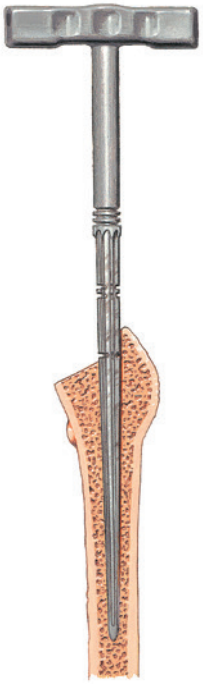
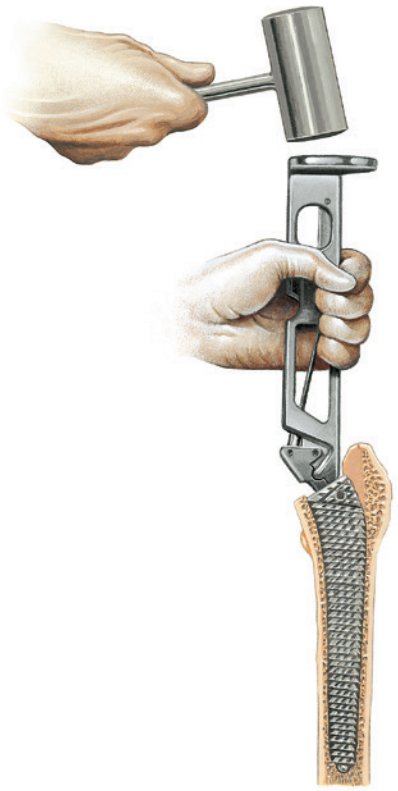


Figure 2

Femoral broaching

4. Start the broaching procedure along the mid-axis of the femur with the Size 1 broach and progressively broach to the appropriate femoral stem size. Seat the broach slightly below the level of the femoral neck resection to facilitate calcar reaming.

The SPECTRON◊ EF broach is designed to provide a minimum 1.5 mm cement mantle per side. Additional cement mantle thickness is achieved by pressurizing the cement into the cancellous bone. The broach is slightly longer than the corresponding implant to accommodate the distal centralizer.



Calcar preparation and trialing

5. With the final broach fully seated, remove the broach handle and ream the calcar with the appropriate calcar reamer. The smaller calcar reamer is used with broach sizes 1–3, and the larger calcar reamer is used with broach sizes 4 and 5. Plane the calcar until it is level with the broach.

Trialing

6. Remove the calcar reamer and place the matching standard or high offset trial neck (as determined by templating) onto the broach post. Select the trial femoral head of desired diameter and neck length and reduce the hip to assess stability. Soft tissue tension can be improved by using the high offset trial neck instead of the standard offset trial neck without increasing leg length.

If trialing for the universal Bipolar or Unipolar, trial according to the appropriate technique for the selected device.

Standard offset High offset

Femoral head and neck length options

Trial color	22 mm	26 mm	28 mm	32 mm
Green			-3	-3
Yellow	+0	+0	+0	+0
Red	+4	+4	+4	+4
Whtie	+8	+8	+8	+8
Blue	+12*	+12*	+12*	+12*
Black			+16*	+16*

* Denotes skirted head

Placing The BUCK Cement Restrictor

7. The proximal flange of the cement restrictor should always be larger than the distal canal diameter. Use the canal sizer to determine the distal canal diameter. Accurate cement restrictor depth placement is then determined by placing the SPECTRON◊ EF stem (with attached distal centralizer) next to the inserter tool and adding 20 mm to the length (see Table 1).

Remove the vent-occluding membrane by inserting the vent opening tool into the threaded end of the restrictor and pushing the pin through the vent hole. Remove and discard the plastic debris.

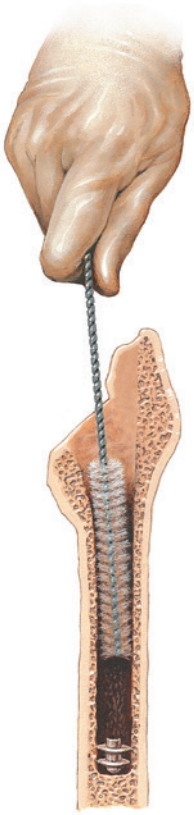
Thread the cement restrictor onto the inserter using a clockwise motion. Insert the device to the level of the medullary canal that has been predetermined. Once this level is reached, disengage the restrictor from the inserter using a counterclockwise twisting motion. Remove the inserter from the medullary canal. If it is necessary to remove the restrictor prior to cement insertion, it can be reattached to the inserter rod and pulled out of the canal. The surgeon may adjust the restrictor as many times as required.

Table 1

Stem size	BUCK Cement Restrictor insertion depth (mm)
1	140
2	150
3	160
4	160
5	160

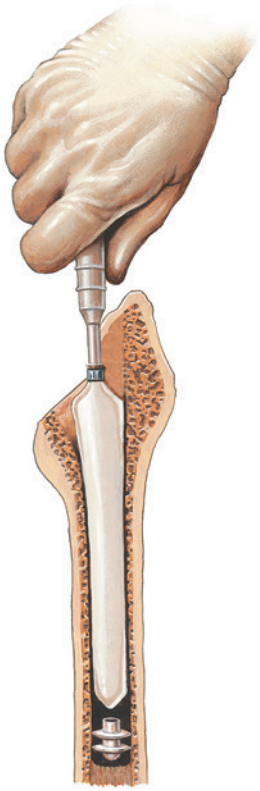
Preparing the femoral canal

8. Attach the broach handle to the broach and remove the broach. Irrigate the canal with saline solution and pulsatile lavage to remove all debris. Continue preparing the femur with the femoral canal brush to remove any remaining weak cancellous bone, blood clots, and marrow fats. Repeat lavaging as necessary to remove all remaining debris.



Drying the femoral canal

9. Insert the femoral canal suction absorber into the femoral canal to dry the canal while mixing the cement.



Injecting cement

Loading cement

10. Load cement powder and monomer into the MixOR™ funnel. If you load powder first, use the funnel for both. If you prefer monomer first, load monomer without funnel, then attach and load powder.

Mixing

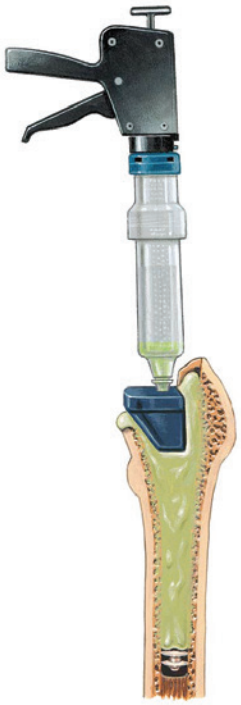
11. Mix the cement according to manufacturer's instructions using brisk plunging movements. Turn handle at top and bottom of cartridge to achieve optimal homogenous mixture. Refer to MixOR instruction card for complete mixing technique.

Injecting cement

12. After removing the femoral canal suction absorber use pulsatile lavage. Insert the nozzle of the cement gun to the top of the Buck Cement Restrictor and inject cement into the canal in retrograde fashion. Continue injecting cement until the canal is completely full and the distal tip of the nozzle is clear of the canal.

Pressurizing cement

13. Break off the long nozzle and place the femoral pressurizer over the short nozzle. Apply the disposable femoral pressurizer into the mouth of the canal. This will occlude the canal and compress the cement. Maintain firm pressure until the cement is in a doughy state and can withstand displacement and will allow for proper cement interdigitation into trabecular bone. Withdraw the femoral pressurizer and remove any extruded cement around the periphery of the canal.



Selecting stem and distal centralizer

14. Use the implant which corresponds to the last broach seated in the femur. An optional distalcentralizer may be placed on the stem to provide neutral alignment and predictable cement mantle. Each implant has a corresponding distal centralizer which is intended to provide a uniform 1.5 mm distal cement mantle. Note, however, all of the stems will accommodate any of the available distal centralizers to address variations in distal femoral geometries. Using clean gloves, place the round plug of the selected centralizer into the hole at the distal end of the stem and push the centralizer superiorly until snug (see Table 2).

Note: If a distal centralizer is not used, place the distal hole plug which is packaged with the implant into the centralizer hole prior to inserting the stem.

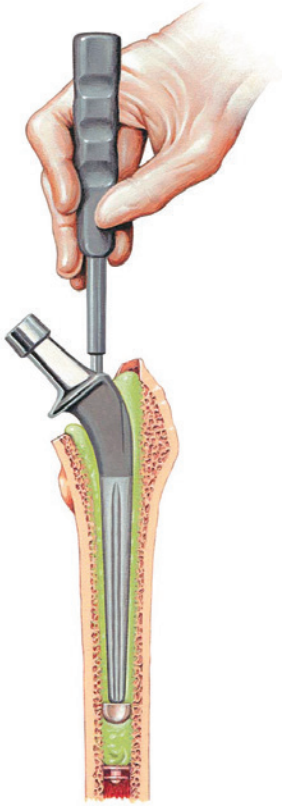
Table 2

Stem size	Minimum centralizer size
Sizes 1, 1H	8 mm
Sizes 2, 2H	9 mm
Sizes 3, 3H	10 mm
Sizes 4, 4H	12 mm
Sizes 5, 5H	13 mm

Stem insertion

15. Insert the selected femoral stem into the canal. Fit the femoral stem driver into the stem driving platform and push into place. Advance the stem approximately 1 cm per second to avoid air inclusions in the stem/cement interface.

Trim away excess cement with Concise cement sculps. Remove the stem driver and maintain steady pressure with the thumb on the stem taper until cement is cured.

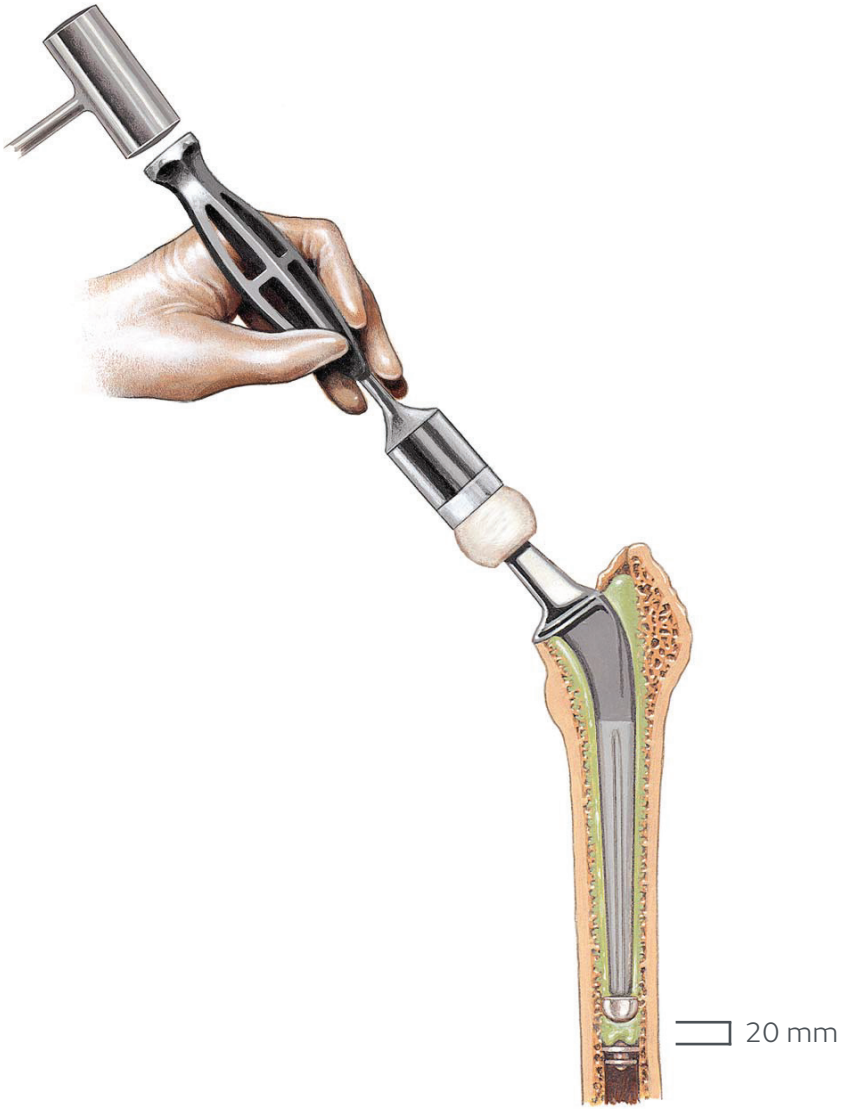


Final trial reduction

16. A final trial reduction may be performed at this time using trial femoral heads.

Femoral head assembly

17. Clean and dry the neck taper with a clean sterile cloth, place the prosthetic femoral head on the neck taper and firmly impact several times with a head impactor and a mallet.



Catalog information

SPECTRON◊ EF 12/14 femoral stem components

SPECTRON EF 12/14 Primary Collared Standard Offset Stems
Cobalt Chromium

Size	Stem length	Implant cat. no.	Broach/Trial cat. no.	Trial neck cat.no.
1	115 mm	71312101	71365001	71365081
2	125 mm	71312102	71365002	71365082
3	135 mm	71312103	71365003	71365083
4	135 mm	71312104	71365004	71365084
5	135 mm	71312105	71365005	71365085

SPECTRON EF 12/14 Primary High Offset Stems
Cobalt Chromium

Size	Stem length	Implant cat. no.	Broach/Trial cat. no.	Trial neck cat.no.
1H	115 mm	71312111	71365001	71365091
2H	125 mm	71312112	71365002	71365092
3H	135 mm	71312113	71365003	71365093
4H	135 mm	71312114	71365004	71365094
5H	135 mm	71312115	71365005	71365095

SPECTRON INVIS◊ Distal Centralizers

Cat. no.	Size	O.D.
71313101	1	8 mm
71313102	2	9 mm
71313103	3	10 mm
71313104	4	12 mm
71313105	5	13 mm

INVIS Distal Centralizers

Cat. no.	O.D.
71313208	8 mm
71313209	9 mm
71313210	10 mm
71313211	11 mm
71313212	12 mm
71313213	13 mm
71313214	14 mm

INVIS Distal Centralizers

Cat. no.	O.D.
71313215	15mm
71313216	16mm
71313217	17 mm
71313218	18 mm
71313219	19 mm
71313220	20 mm
71313221	21 mm

OXINIUM® 12/14 Taper Femoral Heads

Neck length	22mm	26mm	28mm	32mm	36mm	40mm	44mm
-4						71342340 & sleeve 71344245	71342344 & sleeve 71344245
-3			71342803	71343203	71343603		
+0	71342200	71342600	71342800	71343200	71343600	71342340 & sleeve 71344247	71342344 & sleeve 71344247
+4	71342204	71342604	71342804	71343204	71343604	71342340 & sleeve 71344248	71342344 & sleeve 71344248
+8	71342208	71342608	71342808	71343208	71343608	71342340 & sleeve 71344249	71342344 & sleeve 71344249
+12	71342212	71342612	71342812	71343212	71343612		
+16			71342816	71343216			

CoCr 12/14 Taper Femoral Heads

Cobalt Chromium

Neck length	22mm	26mm	28mm	32mm	36mm	40mm	44mm
-4						71342640 & sleeve 71344245	71342644 & sleeve 71344245
-3			71302803	71303203	71303603		
+0	71302200	71302600	71302800	71303200	71303600	71342640 & sleeve 71344247	71342644 & sleeve 71344247
+4	71302204	71302604	71302804	71303204	71303604	71342640 & sleeve 71344248	71342644 & sleeve 71344248
+8	71302208	71302608	71302808	71303208	71303608	71342640 & sleeve 71344249	71342644 & sleeve 71344249
+12	71302212	71302612	71302812	71303212	71303612		
+16			71302816	71303216			

TANDEM◊ Unipolar 12/14 Taper Femoral Heads
Cobalt Chromium

Neck length	Sleeve	40-55mm	57mm	59mm	61mm
-3	71326603	126640-55	126657	126659	126661
+0	71326600	126640-55	126657	126659	126661
+4	71326604	126640-55	126657	126659	126661
+8	71326608	126640-55	126657	126659	126661
+12	71326612	126640-55	126657	126659	126661

SPECTRON◊ Stems are compatible with all sizes of TANDEM Unipolar Heads.

The TANDEM Unipolar heads must be used with the TANDEM Unipolar Taper Sleeves. The Unipolar Heads do not fit on a standard 12/14 Taper Stem by themselves. The 12/14 TANDEM Unipolar Taper Sleeves allow the TANDEM Unipolar Heads to fit on the SPECTRON 12/14. The inner Taper of the TANDEM Unipolar Taper Sleeves matches the SPECTRON Stem Taper.

BIOLOX® Delta 12/14 Taper Ceramic Femoral Heads

Neck length	32mm	36mm	40mm
-3			
+0	76539160	76539165	71346004
+4	76539161	76539166	71346005
+8	76539162	76539167	71346006
+12		76539153	
+16			

Trial 12/14 Taper Femoral Heads

Neck length	Color Code	22mm	26mm	28mm	32mm
-3	Green			71352803	71353203
+0	Yellow	71352200	71352600	71352800	71353200
+4	Red	71352204	71352604	71352804	71353204
+8	White	71352208	71352608	71352808	71353208
+12	Blue		71352612	71352812	71353212
+16	Black			71352816	71353216

Titanium Modular Head Sleeve 12/14 Taper

Neck length	Cat. no.
-4	71344245
+0	71344247
+4	71344248
+8	71344249

*Use with 40mm and 44mm OXINIUM® and CoCr Modular Femoral Heads

Implant compatibility

SPECTRON EF Stems

Femoral Heads	Modular Femoral Heads and Sleeves	Unipolar Heads and Sleeves
OXINIUM◊ Cobalt Chrome BIOLOX® Delta Ceramic	Titanium Modular Head Sleeves – 12/14 Taper	Unipolar Taper Sleeves 12/14 Taper Unipolar Taper Sleeves 14/16 Taper
	OXINIUM Modular Femoral Heads Cobalt Chrome Modular Femoral Heads	TANDEM◊ Unipolar Heads

Products may not be available in all markets because product availability is subject to the regulatory and/or medical practices in individual markets. Please contact your Smith+Nephew representative or distributor if you have questions about the availability of Smith+Nephew products in your area.

Smith & Nephew, Inc.
1450 Brooks Road
Memphis, Tennessee 38116
USA

www.smith-nephew.com
Telephone: 1-901-396-2121
Information: 1-800-821-5700
Orders/Inquiries: 1-800-238-7538

21885 V3 71380478 REVB 03/23