

Constrained liner



Design surgeon list

Smith & Nephew thanks the following surgeons for their participation as part of the R3° system design team:

Robert Barrack, MD
St. Louis, Missouri

Robert Bourne, MD
London Health Sciences Center
London, Ontario, Canada

Jonathan Garino, MD
University of Pennsylvania
School of Medicine
Philadelphia, Pennsylvania

Wayne M. Goldstein, MD
Clinical Professor of Orthopaedics
University of Illinois at Chicago
Illinois Bone and Joint Institute
Chicago, Illinois

Richard Kyle, MD
Minneapolis, Minnesota

Stephen J. McMahon, MB, BS, FRACS(Orth), FA(Orth)A
Senior Lecturer Monash University
Malabar Orthopaedic Clinic
Melbourne, Australia

John L. Masonis, MD
OrthoCarolina
Hip & Knee Center
Charlotte, North Carolina

Henrik Malchau, MD
Associate Professor, Harvard Medical School
Co-Director, The Harris Orthopaedic Biomechanics
and Biomaterials Laboratory
Massachusetts General Hospital
Boston, Massachusetts

Michael Ries, MD
University of California
San Francisco, California

Cecil Rorabeck, MD
Professor of Orthopaedic Surgery
University of Western Ontario
London, Ontario, Canada

Nota Bene: The technique description herein is made available to the healthcare professional to illustrate the authors' suggested treatment for the uncomplicated procedure. In the final analysis, the preferred treatment is that which addresses the needs of the patient. For more information on the product, including its indications for use, contraindications, and product safety information, please refer to the product's label and the Instructions for Use.

Short technique



1. Liner impaction



2. Reduce hip

In the event that dislocation is required, the head removal tool may be used. Fully insert the tip of the appropriated sized removal tool inside the inner bearing (around the femoral head) and hold until the femoral head is dislocated.



3. Removal tool positioning



4. Femoral head removal

R3[◊] constrained liner product overview

Innovation, a fundamental Smith & Nephew principle is again displayed in the R3[◊] Acetabular System. The R3 acetabular cup is designed to accommodate multiple bearing options and STIKTITE[◊] provides a porous coating designed to enhance bony in-growth. The system will allow you to go from resurfacing to a constrained liner without removing a well fixed shell. The R3 polyethylene liner locking mechanism is a robust design that allows for easy liner insertion and removal, and outstanding liner/shell stability.

The R3 constrained liner is designed for total hip replacement patients who suffer from or are at risk for recurrent dislocations. The R3 constrained liner option consists of a bipolar bearing which articulates with a captured outer polyethylene liner. This will allow for motion at two interfaces; the femoral head with the bipolar and the bipolar with the outer liner.

The constrained liner is made of conventional, non-irradiated UHMWPE to retain the polyethylene material properties. Combined with the Smith & Nephew circuloapezoidal neck, a range of motion between 82° to 102° can be achieved depending on the liner size used. ^{1,2†*}

* Individual results in patients may vary.

† Based on computer modelling

Product overview

The range of motion achievable with a constrained liner is less than the range of motion of a normal joint, and less than with a semi-constrained prosthesis.

Use of a constrained liner in combination with a skirted head is not recommended. Skirted heads may reduce prosthetic ROM to clinically unacceptable levels.

R3 Constrained Liner ROM chart

Liner	ROM
52	82°
54	82°
56	90°
58	90°
60	96°
62	96°
64	102°
66-70	102°

R3[◇] constrained liner surgical technique

Constrained liners should only be used as a last resort, and only when all other available options to avoid dislocations have been exhausted. Such options include, but are not limited to, reorienting or using a different liner option, using a prosthesis with a larger head diameter, a stem with increased offset, or a head with increased length.

Surgical tip:
Refer to the Smith & Nephew RENOVATION[®] implant removal system reference guide for information on removing a well fixed shell.

Shell preparation

When inserting a new R3 shell; prepare the acetabulum and insert the shell as instructed in the R3 surgical technique. The use of screws is recommended due to lack of bone in-growth and the stability they add to the construct.

To remove a R3 liner: Remove the existing liner using the liner removal tool. Ensure the shell is free and clear of debris prior to inserting a new liner into the shell.

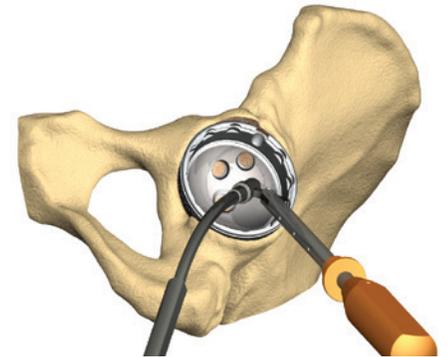


Acetabular screw insertion

Screw fixation is simple, fast and the most common method of assuring additional fixation. Acetabular screws work in compression, which allows the shell to fully seat in the acetabular cavity.

For screw fixation, each screw hole must be predrilled. Using the variable angle drill guide, adjust the angle of the tip to align with the selected screw hole and **press firmly in the shell**. After drilling the hole, use the depth gauge to verify appropriate screw length(s).

Use the screw forceps to hold the screw. Attach the ball-joint or flexible screwdriver shaft to the end of the screw. Then introduce the screw into the hole and screw it into place using the ratcheting screwdriver handle. Make sure the screw is fully seated within the screw hole so that it will not impinge on the acetabular shell/liner.



Constrained liner insertion

Determine the appropriate size constrained liner and internal femoral head size that will be used. Constrained liners may be used with CoCr and OXINIUM®. The R3° constrained liners are designed to accommodate one liner per shell size. The R3 constrained liner is fully assembled when removed from the sterile packaging. A head exchange will most likely be necessary.

Insert the R3 constrained liner into the acetabular component by hand and rotate until the tabs on the liner align with the scallops in the shell. The locking ring is designed to fit into the groove around the rim of the R3 shell.

Assemble the appropriate size constrained liner impactor head to R3 shell impactor and then position tip inside liner.



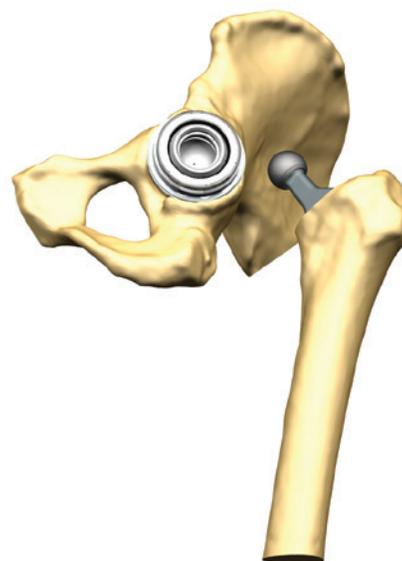
Impact until lock ring has engaged in the shell.



Once the constrained liner is in place do not perform a trial reduction as the trial head may be difficult to remove.

If a new femoral head is used, lock onto the stem using the femoral head impactor.

Minimal force is required to reduce the hip; however, joint laxity among other patient factors may have an effect.



Reduce the hip. Avoid aggressive range of motion evaluation as it could compromise implant function and may result in unintentional dislocation, extended OR time and/or adverse patient effects.



In the event that dislocation is required, the head removal tool may be used. Fully insert the tip of the appropriate sized removal tool inside the inner bearing (around the femoral head) and hold until the femoral head is dislocated.



R3[◇] constrained liner sizing

Shell OD in mm	Bipolar OD in mm	Bipolar ID in mm	Outer poly thickness in mm	Outer spherical diameter in mm
52	38	22	4	46.5
54	38	22	5	48.5
56	40	22	5	50.5
58	40	22	6	52.5
60	44	28	5	54.5
62	44	28	6	56.5
64	48	28	5	58.5
66-70	48	28	6	60.5



Catalog

71339152	R3° Constrained Acetabular Liner 52mm
71339154	R3 Constrained Acetabular Liner 54mm
71339156	R3 Constrained Acetabular Liner 56mm
71339158	R3 Constrained Acetabular Liner 58mm
71339160	R3 Constrained Acetabular Liner 60mm
71339162	R3 Constrained Acetabular Liner 62mm
71339164	R3 Constrained Acetabular Liner 64mm
71339166	R3 Constrained Acetabular Liner 66-70mm

71362014	Constrained Liner Instrument Tray
71362015	R3 Constrained Liner 22mm Impactor Head
71362016	R3 Constrained Liner 28mm Impactor Head
71362017	R3 Constrained Liner Head Removal Tool 22
71362018	R3 Constrained Liner Head Removal Tool 28
71364009	Femoral Head Impactor

References

1. Barrack RL, Thornberry RL, Ries MD, Lavernia C, Tozakoglou E. The Effect of Component Design on Range of Motion to Impingement in Total Hip Arthroplasty. AAOS Instructional Course Lectures. 2001;50:275 - 280.
2. Thornberry RL, Lavernia CJ, Barrack RL, Tozakoglou E. The Effects of Neck Geometry in Acetabular Design on Motion to Impingement. Paper presented at: AAHKS Eighth Annual Meeting; 1998.

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Orthopaedics

Smith & Nephew, Inc.
7135 Goodlett Farms Parkway
Cordova, TN 38016
USA

www.smith-nephew.com

Telephone: 1-901-396-2121
Information: 1-800-821-5700
Orders and Inquiries: 1-800-238-7538