Smith+Nephew

MODULAR RADIAL HEAD (MRH)

System

Surgical Technique



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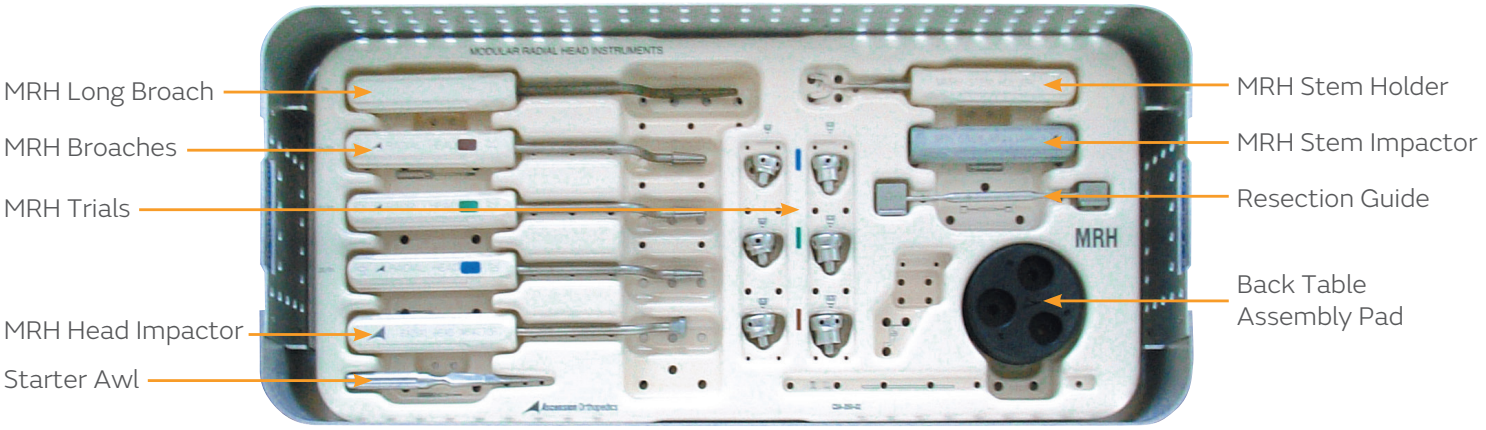
MODULAR RADIAL HEAD System overview

Radial head implants system with 4 stems and 6 head sizes



The Smith+Nephew MODULAR RADIAL HEAD (MRH) System provides head shape, stem design and size combinations to help address a broad range of patient anatomy.



Note 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 the Instructions for Use packaged with the product.

Prior to performing this technique, please consult the Instructions for Use documentation provided with each device for additional health and safety information, including indications, contraindications, warnings and precautions.

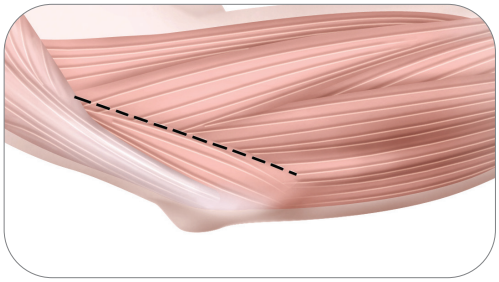


Figure A

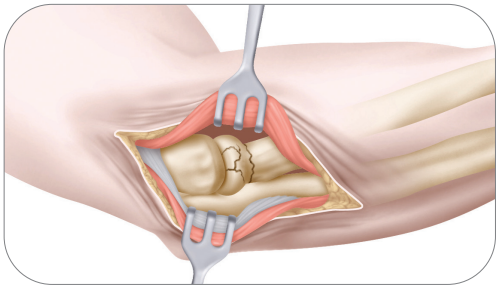


Figure B

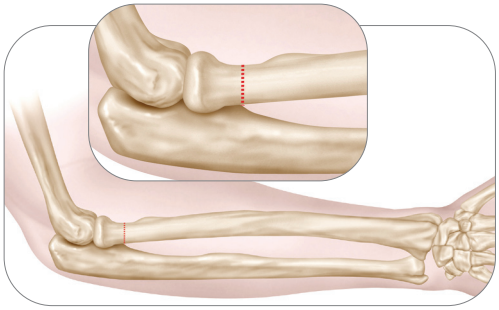


Figure 1-1

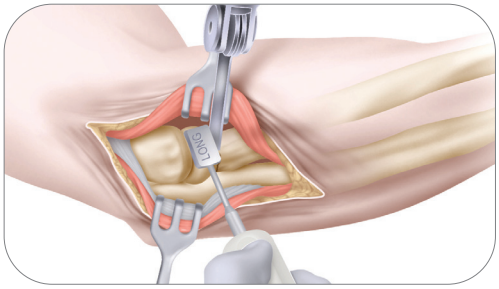


Figure 1-2

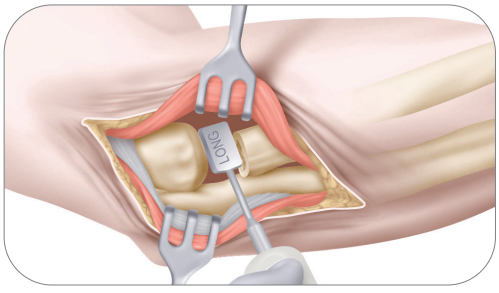


Figure 1-3

Surgical Technique

In Cases of Mason Type 3 or 4, Revision of Excision, or an Inability to Plate:

Incision and exposure:

Expose the radial capitellar joint using the Kocher approach through the interval between the anconeus and extensor carpi ulnaris muscles. Make a 6-7cm incision centered on the radial head. **(Figure A)**

Pronate the forearm during exposure to protect the motor branch of the radial nerve that passes around the radial neck. If needed, release the origin of the anconeus subperiostally and retract it posteriorly to permit adequate exposure of the capsule. Continue the dissection to the joint capsule. Divide the annular ligament (AL) and radial collateral ligaments (RCL) longitudinally along the centerline of the radial head. Reflect the lateral capsule anteriorly and posteriorly to expose the radial head. **(Figure B)**

Step 1 ▪ Resecting the Radial Head

1-1 The radial head resection guide has two resection levels. Inspection of the radial head and trauma to the neck will determine if the standard or long radial head implant will be used. Prior templating of the X-ray will also assist in determining which radial head will be used. Use the normal or long Radial Head Resection Guide to mark the level of the resection.

With one edge of the guide resting on the capitellum, use a surgical marker to mark the resection line on the neck of the radius by resting the tip of the marker against the distal side of the guide while rotating the forearm through supination-pronation. The resulting line should mark a plane that is perpendicular to the pronation-supination axis of the forearm. **(Figure 1-1)** Resect the head holding the saw blade perpendicular to the axis of rotation. **(Figure 1-2)** Reinsert the guide between the capitellum and the resection to ensure a perpendicular cut. **(Figure 1-3)** Avoid excessive resection of the radial head as this may preclude implant placement.

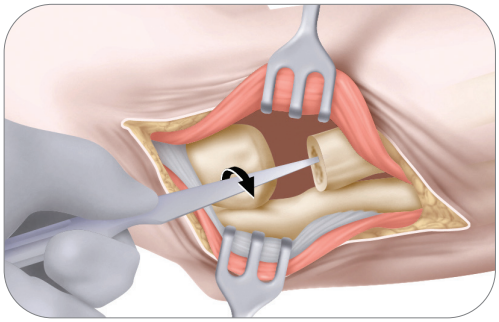
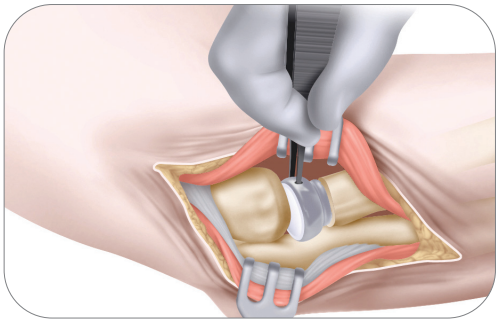


Figure 2-1



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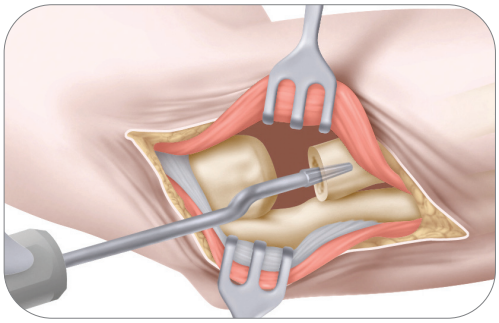


Figure 4-1

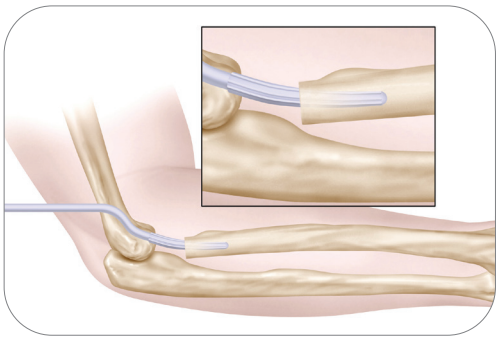


Figure 4-2

Step 2 ▪ Intramedullary Preparation for Radial Head Trials

2-1 The medullary canal is now prepared for insertion of a radial head trial to assess appropriate size and fit. For unstable elbows, varus stress and rotation of the forearm into supination allows improved access to the medullary canal. For stable elbows with inadequate exposure to access the medullary canal, careful reflection of the origin of the collateral ligament from the lateral epicondyle may be necessary to permit subluxation to the medullary canal. Enter the canal with the starter awl using a twisting motion. **(Figure 2-1)**

The starter awl should be inserted only 2 cm. The radial head trial has an undersized stem to allow insertion without dislocation of the elbow and for maintaining the integrity of the medullary canal for the final press fit.

Step 3 ▪ Trial Reduction

3-1 Select the trial closest in size to, but not larger than, the resected head by inserting and estimating the resected head size with the back table assembly plate. Insert the trial stem into the hole created by the Starter Awl. **(Figure 3-1)**

Assess elbow stability and tracking in forearm flexion, extension, and rotation. An osteotomy that is poorly-aligned will cause the trial to be unstable during the assessment. Be sure to coapt or slightly overlap the dissected capsule edges (previously reflected anteriorly and posteriorly) to assess the fit of the AL around the head of the trial. The edges should meet easily. If the AL cannot wrap completely around the trial, a smaller trial and implant are recommended.

Step 4 ▪ Broach the Canal

4-1 Once the implant size has been determined, remove the trial and broach the canal. **(Figure 4-1)** Broach progressively up to the selected implant size starting with the smallest sized broach (all 6 implant head sizes can be attached to any of the 4 stem implants). The broach should be aligned with the pronation-supination axis and perpendicular to the resection.

Long Stem Broaching

A long stem option can be used in instances where an oblique fracture, revision of an ORIF or primary replacement, or if an irrecoverable bone loss has occurred distal to the standard or long osteotomy line. The curved stem design can provide optimal stability via improved centralization into the angled canal of the radius.

Note: Correct insertion of the long stem broach into the canal is with the bow toward the tuberosity of the radius and the tip point in the direction of the thumb. **(Figure 4-2)**

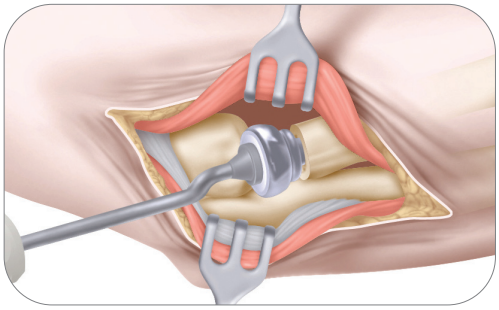


Figure 5-1

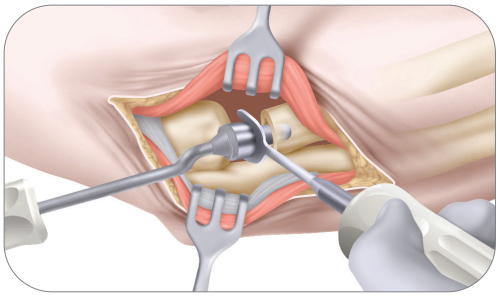


Figure 5-2

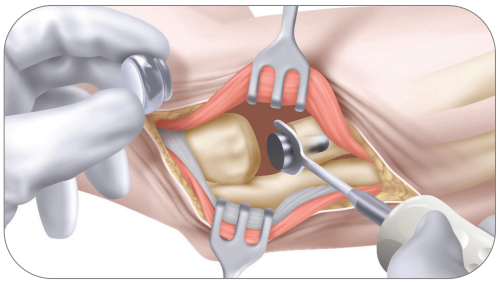


Figure 5-3

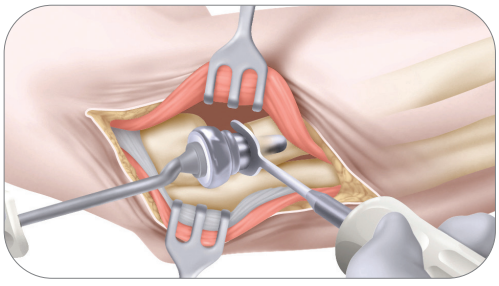


Figure 5-4

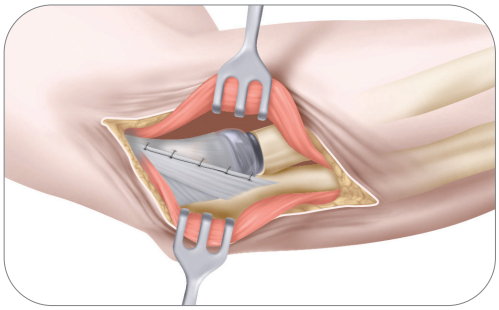


Figure 6-1

Step 5 ▪ Assembly and Implantation

There are two options to assemble the stem-head components.

OR Back Table Assembly

Using the back table assembly plate, place the correct size head on the back table assembly plate. The morse taper of the implant stem is inserted into the implant head taper. Place the stem impactor over the stem. The implant taper is seated by firm impaction with a mallet.

Using finger control, insert the prosthesis stem into the prepared hole. It may be necessary to retract the radius to access the canal and allow the head to clear the capitellum. Retraction of the radius can be facilitated with use of a small bone holding clamp. Using the provided head impactor, impact the implant until the collar abuts the osteotomy. **(Figure 5-1)**

In Situ Assembly

The MODULAR RADIAL HEAD can be assembled in situ. Place the correctly sized stem into the prepared medullary canal of the radius. Place the stem holder instrument around the collar of the stem. Using the head impactor instrument, impact the stem into the canal until it is flush with the osteotomy. **(Figure 5-2)** Place the head component on the morse taper of the stem. **(Figure 5-3)** Seat the implant taper with firm impaction using the head impactor. **(Figure 5-4)** Remove the stem holder and impact the implant until flush with the osteotomy.

Step 6 ▪ Closure

A simple closure is sufficient as long as the collateral ligament is not disrupted. Repair the AL and RCL. **(Figure 6-1)** Repair the fascial interval connecting the anconeus and extensor carpi ulnaris muscles. Close the skin. Splint the elbow at 90° flexion and in neutral to full pronation.

Post-operative guidelines*

Traditional Kocher Approach:

- Place the operated arm in rest in an upper-arm sling for a period of 4-5 days.
- After 4-5 days, gradual mobilization starts within the comfort zone.
- The sutures would be removed at 2 weeks, and formal therapy would be undertaken in the form of mobilization.
- Delay in recovery is dependent on the amount of damage to and detachment of the extensor muscle mass needed to insert the implant. Mobilization can be delayed depending on the amount of incision to the annular ligament. If the annular ligament was significantly incised, then rehabilitation should proceed slowly to protect the stability of the radial stump.
- If the elbow is considered stable, passive flexion and extension is allowed at 2 days post-op. Both flexion/extension and pronation/supination arcs are permitted without restriction. Active motion can generally begin by 5 days.

*Postoperative care is individualized and is determined by the physician based on the patient's injury pattern, unique patient anatomy, and pathologic kinematics. Not all patients will have the same surgical procedure or timelines for rehabilitation. The views and opinions expressed for postoperative care are for informational and educational purposes only. Smith & Nephew, Inc. does not provide medical advice. In no event shall Smith & Nephew, Inc., be liable for any damages whatsoever (including, without limitation, damages for loss of business profits, business interruption, loss of business information, or other pecuniary loss) arising out of the use of or inability to use the expressed views.

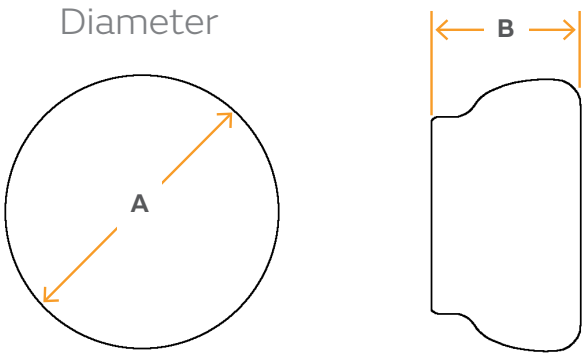
Component dimensions

MRH Head Dimensions (mm)

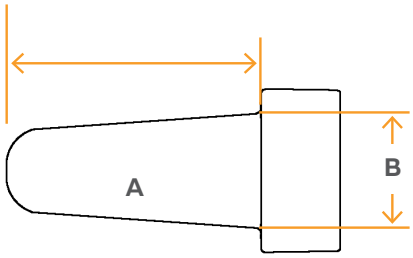
Size	A	B	Reference
20S	20.0	10.9	MRH-350-20S-WW
22S	22.0	12.0	MRH-350-22S-WW
24S	24.0	13.0	MRH-350-24S-WW
20L	20.0	16.0	MRH-350-20L-WW
22L	22.0	17.1	MRH-350-22L-WW
24L	24,0	18.1	MRH-350-24L-WW

MRH Stem Dimensions (mm)

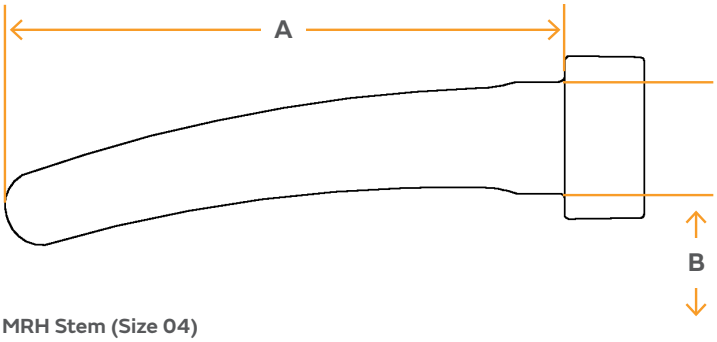
Size	A	B	Reference
01	17.0	7.6	MRH-350-01-WW
02	18.7	8.4	MRH-350-02-WW
03	20.5	9.2	MRH-350-03-WW
04	40.9	7.6	MRH-350-04-WW



MRH Head



MRH Stem (Size 01, 02, 03)



MRH Stem (Size 04)

Product information

MODULAR RADIAL HEAD (MRH) Implants

Referenced	Description	Size
MRH-350-20S-WW	Standard Head	20mm
MRH-350-22S-WW	Standard Head	22mm
MRH-350-24S-WW	Standard Head	24mm
MRH-350-20L-WW	Long Head	20mm
MRH-350-22L-WW	Long Head	22mm
MRH-350-24L-WW	Long Head	24mm
MRH-350-01-WW	Standard Stem	01
MRH-350-02-WW	Standard Stem	02
MRH-350-03-WW	Standard Stem	03
MRH-350-04-WW	Long Stem	04

MODULAR RADIAL HEAD Instruments

Referenced	Description	Size
OSG-350-01	MRH Resection Guide	-
AWL-100-01	Starter Awl	-
TRL-351-20S	MRH Trial Standard	MRH Trial Size 20
TRL-351-22S	MRH Trial Standard	MRH Trial Size 22
TRL-351-24S	MRH Trial Standard	MRH Trial Size 24
TRL-351-20L	MRH Trial Long	MRH Trial Size 20
TRL-351-22L	MRH Trial Long	MRH Trial Size 22
TRL-351-24L	MRH Trial Long	MRH Trial Size 24
BRH-300-20	MRH Broach	MRH Broach Size 01
BRH-300-22	MRH Broach	MRH Broach Size 02
BRH-300-24	MRH Broach	MRH Broach Size 03
BRH-350-04	MRH Broach	MRH Broach Size 04
IMP-350-01	MRH Back Table Assembly Pad	-
IMP-300-00	MRH Head Impactor	-
EXT-350-00	MRH Stem Holder	-
IMP-350-00	MRH Stem Impactor	-

Surgical technique

Smith+Nephew does not practice medicine and does not recommend this or any other surgical technique for use on a specific patient. The surgeon who performs any implant procedure is responsible for determining and using the appropriate techniques for implanting the device in each patient.

Notes

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