

Surgical Technique





Acumed® is a global leader of innovative orthopaedic and medical solutions.

We are dedicated to developing products, service methods, and approaches that improve patient care.



Acumed® Anatomic Radial Head Solutions

The Acumed Anatomic Radial Head System is designed to provide an anatomic implant to replace the patient's native radial head. Designed in conjunction with Shawn W. O'Driscoll, Ph.D., M.D., the Acumed Anatomic Radial Head System includes 290 head and stem combinations including standard stems, long stems, an anatomically shaped radial head, and system-specific instrumentation to help streamline the surgeon's experience in the operating room.

Indications for Use:

- Replacement of the radial head for degenerative or post-traumatic disabilities presenting pain, crepitation, and decreased motion of the radiohumeral and/or proximal radio ulnar joint with joint destruction and/or subluxation, resistance to conservative treatment.
- Primary replacement after fracture of the radial head.
- Symptomatic replacement after radial head resection.
- Revision following failed radial head arthroplasty.

In addition to the Anatomic Radial Head System, this set may include the Acutrak 2® Mini and Micro instruments and the Locking Radial Head Plate System at the base of the tray to provide multiple solutions all in one set. For the Acutrak 2 Headless Compression Screw System surgical technique, please reference part number SPF00-02. For the Locking Radial Head Plate System surgical technique, please reference part number ELB00-02.

Surgical Technique
Design Surgeon

[Shawn W. O'Driscoll, Ph.D., M.D.](#)

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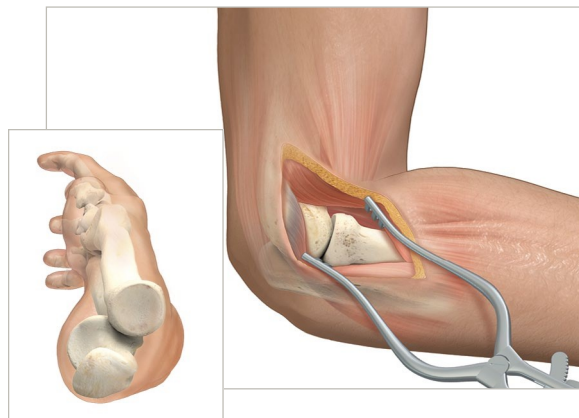
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Anatomic Radial Head—Standard Stem Surgical Technique

SHAWN W. O'DRISCOLL, PH.D., M.D.

1 INCISION AND DISSECTION

There are several exposure options, depending on the integrity of the lateral soft tissues. In fracture-dislocations, the exposure is through the traumatic opening in the ligament complex. For delayed reconstructions, and in those acute cases in which the lateral collateral ligament is intact, the Kaplan interval permits the ligament to be left intact. The deep incision is placed in a line from the lateral epicondyle toward Lister's tubercle, with the forearm in neutral rotation. Proximally, the extensor carpi radialis longus (ECRL) origin is released with the anterior capsule to permit direct access to the front of the radial head.



2 RADIAL HEAD RESECTION

Resect the radial head with a microsagittal saw at the distal limit of the fracture, or as proximal as possible without leaving a significant neck defect. A maximum length of 17 mm of the radius can be replaced. This 17 mm includes the radius length reamed with the collar reamer in Step 4. If longer than 17 mm resection is needed, long stems are available.



3 DETERMINE STEM DIAMETER

Use the 5.5 mm Quick Release Awl (TR-0206) to initially enter the canal. Assemble the Bone Graft Ratcheting T-Handle (BG-8043) to the Standard Stem Reamer 6 mm (80-1606) and prepare the canal for the stem using sequentially larger reamers until a tight fit is achieved. A Radius Retractor (80-1509) is available to elevate the radius. The proper reaming depth is achieved when the laser mark band is even with the level of resection.

Note: The standard stem reamers are 0.5 mm undersized from the implants.





4 REAM WITH COLLAR REAMER

Select the Collar Reamer (TR-CRAXX) that matches the stem diameter determined by the reamer in the previous step. Power ream the collar to create a surface with at least 60% of the radial shaft in contact with the reamer. Use caution to avoid fracturing the radial neck, which can occur if the reamer catches on irregular bone in the fracture surface. The risk of such fracturing can be lessened by reaming initially in the reverse direction, such that the reamer acts more as a power rasp.



5 DETERMINE HEAD DIAMETER

Determine head diameter by placing the resected head upside down in the sizing pockets on the Morse Taper Impactor Block (80-1506). If between sizes, select the smaller diameter.



6 ASSEMBLE HEAD AND STEM GAUGE

Assemble the Height Gauge (TR-TG02) and 6.0 mm Stem Gauge Assembly (TR-TGA06). The height gauge needs to be completely compressed. Insert the 6.0 mm Stem Gauge Assembly into the bone canal.

7 SELECT TRIAL IMPLANTS AND ASSEMBLE

Starting with the +0 end of the ARH Standard & Optional Trial Gauge (80-0832), sequentially increase the height by inserting the end of the gauge under the telescoping head of the assembly, until the head reaches the capitellum. It is critical that the coronoid contacts the trochlea during this process. The coronoid separated from the trochlea is an indicator that the collar is too large. The number on the trial gauge (+0, 2, 4, 6, 8 mm) will correspond to the collar height on the stem.



8 SELECT TRIAL IMPLANTS AND ASSEMBLE

After selecting the Trial Head (TR-TH2XX) and Trial Stem (TR-TSXX or TR-TSXXX), align laser marks on the head and stem and assemble using hand pressure. The stem laser mark is indicated Left or Right ("L" or "R") for proper orientation. If the trial head and stem are difficult to connect, apply saline solution prior to connecting.



9 TRIAL IMPLANT INSERTION

Insert the trial implant into the radius. Ensure that the laser marks on the head and stem are aligned with the lateral aspect of the radius when the forearm is in neutral position. Lister's tubercle may also be used as a landmark for laser mark orientation. Check for proper articulation with the capitellum and the coronoid. The coronoid needs to be in contact with the trochlea to ensure proper positioning of the trial.

Note: Trial components are NOT designed to be implanted.

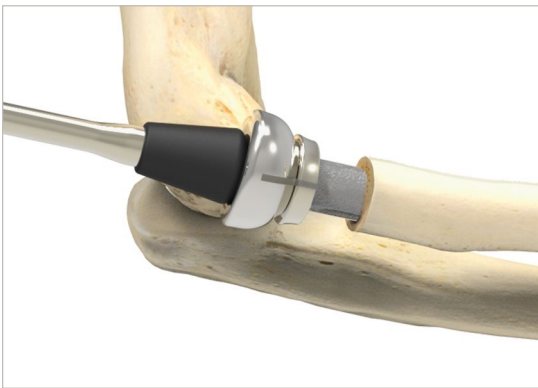
Note: The trial stem diameters are 0.5 mm undersized from the reamers for ease of insertion.





10 IMPLANT ASSEMBLY

After determining the correct size head and stem with the trials, place the implant stem into the appropriate size hole in the Morse Taper Impactor Block. Align laser marks and impact the head and stem, then lock the Morse taper using the Head Impactor (TR-MS05) and a mallet.



11 IMPLANT INSERTION

Insert the implant into the radius using the Head Impactor and a mallet. Ensure that the laser mark on the head is aligned with the lateral aspect of the radius when the forearm is in neutral position. Lister's tubercle may also be used as a landmark for laser mark orientation.



12 POSTOPERATIVE PROTOCOL

Postoperative management is determined by the overall management of the elbow and limb, as though the radial head had never been fractured. For isolated fractures of the radial head and neck without ligament injury, early motion is commenced in flexion and extension as well as pronation and supination. This usually begins within the first few days after surgery.

Note: An ARH Removal Tool Shaft (80-2018) is available in the system for stem removal if needed. For removal instructions, reference the Anatomic Radial Head and Stem Removal technique on page 12.

Anatomic Radial Head—Long Stem Surgical Technique

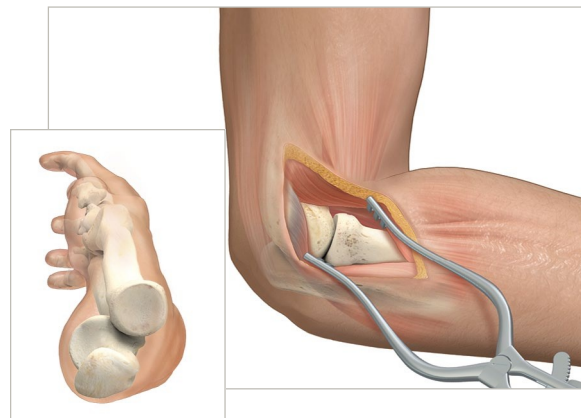
SHAWN W. O'DRISCOLL, PH.D., M.D.

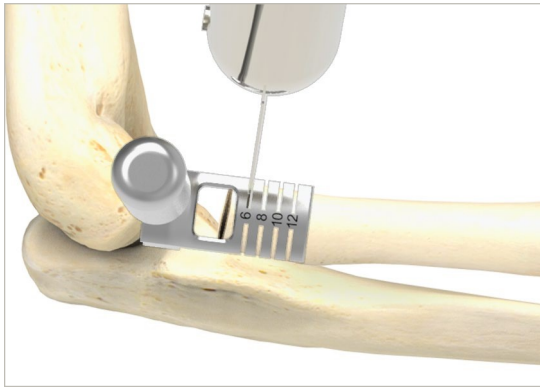
1 INCISION AND DISSECTION

There are several exposure options, depending on the integrity of the lateral soft tissues. In fracture-dislocations, the exposure is through the traumatic opening in the ligament complex. For delayed reconstructions, and in those acute cases in which the lateral collateral ligament is intact, the Kaplan interval permits the ligament to be left intact. The deep incision is placed in a line from the lateral epicondyle toward Lister's tubercle, with the forearm in neutral rotation. Proximally, the extensor carpi radialis longus (ECRL) origin is released with the anterior capsule to permit direct access to the front of the radial head.

Note: Stem removal can be very difficult if a fully porous coated surface is well ingrown with bone. Slap hammers and vice grips are useful. If revising an Acumed Anatomic Radial Head and Stem, an ARH Removal Tool Shaft (80-2018) is available for the stem. A removal technique is available on page 12. After stem removal, find the radial canal distal to the end of the primary stem before reaming. This can be done with a small pointed device such as a Rush reamer.

Note: Image intensification (fluoroscopy) can be helpful in avoiding cortical perforation.

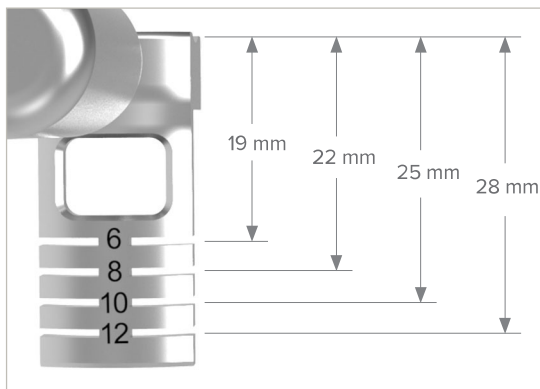




2 RADIAL HEAD RESECTION

Using the Long Stem Resection Guide (80-1512), initially resect the radial head with a microsagittal saw. The use of either a .025" blade, Osteotomy Saw Blade Hub Style L (80-0739-S) or Osteotomy Saw Blade Hub Style S (80-0740-S) is recommended with the microsagittal saw. Resect at the 6 mm stem marking, corresponding to a combined radial head and neck resection of 19 mm.

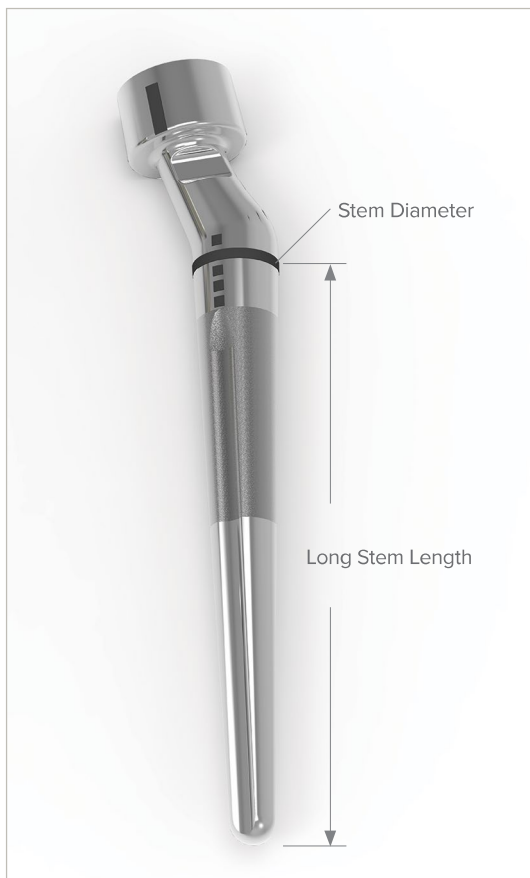
Note: An ARH Long Stem X-ray Template (90-0039) is available for preoperative planning.



The amount of resection varies with the stem diameter shown:

RESECTION REFERENCE CHART

Stem Diameter	Resection Length
6 mm	19 mm
8 mm	22 mm
10 mm	25 mm
12 mm	28 mm



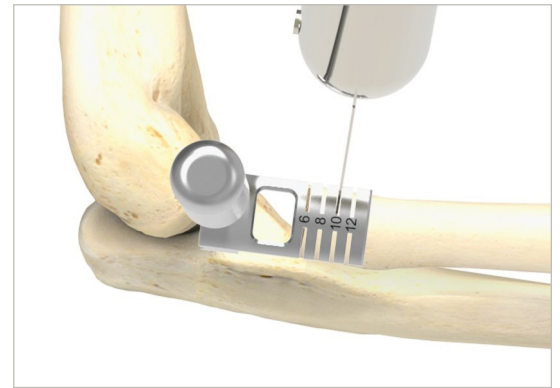
ARH LONG STEM LENGTHS REFERENCE CHART

Stem Diameter	Long Stem Length
6 mm	50 mm
8 mm	55 mm
10 mm	60 mm
12 mm	65 mm

3 DETERMINE STEM DIAMETER

Use the 5.5 mm Quick Release Awl (TR-0206) to initially enter the canal. With the Bone Graft Ratcheting T-Handle (BG-8043) attached to the smallest Long Stem Reamer 6 mm (80-1706), prepare the canal for the stem using sequentially larger reamers until a tight fit is achieved. A Radius Retractor (80-1509) is available to elevate the radius. If the final reamer diameter size is greater than 6 mm (i.e. 8, 10 or 12 mm), re-cut the radial neck using the Long Stem Resection Guide and microsagittal saw to the length corresponding the final reamer diameter size (i.e. 8, 10 or 12 mm). After re-cutting the neck, re-insert the same size reamer until the laser mark band is even with the level of resection.

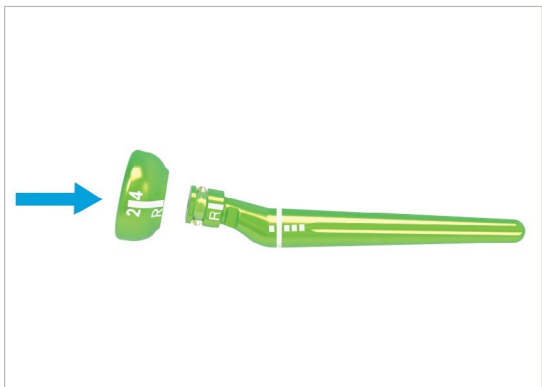
Note: The standard stem reamers are 0.25 mm undersized from the implants.



4 DETERMINE HEAD DIAMETER

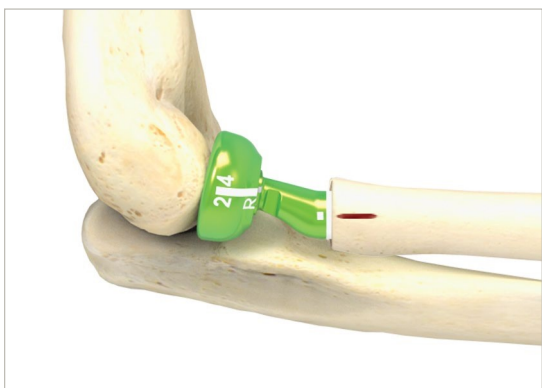
Determine head diameter by placing the resected head upside down in the sizing pockets on the Morse Taper Impactor Block (80-1506). If between sizes, select the smaller diameter.





5 SELECT TRIAL IMPLANTS AND ASSEMBLE

After selecting the Trial Head (TR-TH2XX) and Trial Morse Taper Long Stem (TR-TSLXXX), align the laser marks on the head and stem and assemble using hand pressure. The stem laser mark is indicated Left or Right ("L" or "R") for proper orientation. If the trial head and stem are difficult to connect, apply saline solution prior to connecting.



6 TRIAL IMPLANT INSERTION

Rotate the forearm to a neutral rotation. Mark the lateral aspect of the radial neck with the cautery (in line with Lister's tubercle). The stem laser mark is indicated Left or Right ("L" or "R") for proper orientation. Insert the trial into the radius. Insert to the level of the laser mark (line around stem body) or when the appropriate reduction is achieved.

Note: If restoration length is too long, additional reaming and reinsertion of the trial is suggested.

Ensure the dotted laser mark on the stem is aligned with the cautery mark. The Morse Taper Long Stem Alignment Guide (80-2127) can be used to help with alignment during insertion. Check for proper articulation with the capitellum and the coronoid. The coronoid needs to be in contact with the trochlea to ensure proper positioning of the trial.

Note: Trial components are NOT designed to be implanted.

Note: The long stem trials are the same diameter as the reamers.

7 IMPLANT ASSEMBLY

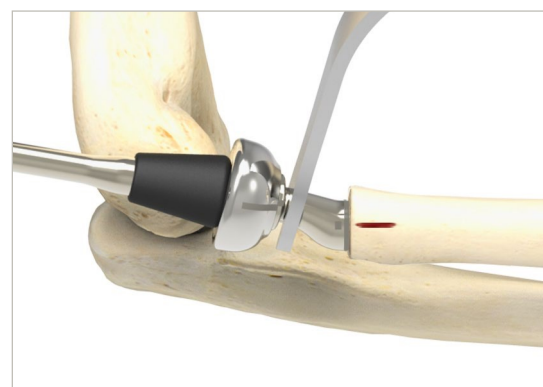
After determining the correct size head and stem with the trials, place the implant stem into the long stem impaction site on the Morse Taper Impactor Block. Align laser marks and assemble the head and stem using hand pressure, then lock the Morse taper engagement between the head and stem using the Head Impactor (TR-MS05) and a mallet.

Note: The implants are identified by stem diameter only. The Left and Right designations are marked on the stem.



8 IMPLANT INSERTION

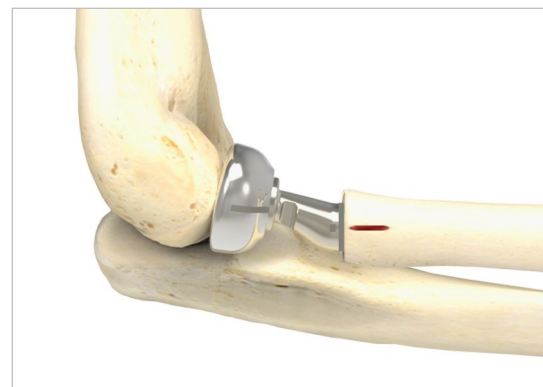
Insert the implant into the radius using the Head Impactor and a mallet. Insert to the level of the laser mark (line around stem body) or when the appropriate reduction is achieved. Ensure that the dotted laser mark on the stem is aligned with the cautery marking on the lateral aspect of the radius when the forearm is in neutral rotation. The Morse Taper Long Stem Alignment Guide can be used to help with alignment during insertion. Check for proper articulation with the capitellum and the coronoid. Lister's tubercle may also be used as a landmark for laser mark orientation.



9 POSTOPERATIVE PROTOCOL

Postoperative management is determined by the overall management of the elbow and limb, as though the radial head had never been fractured. For isolated fractures of the radial head and neck without ligament injury, early motion is commenced in flexion and extension as well as pronation and supination. This usually begins within the first few days after surgery.

Note: An ARH Removal Tool Shaft is available in the system for stem removal if needed. For removal instructions, reference the Anatomic Radial Head and Stem Removal technique on page 12.



Anatomic Radial Head and Stem Removal Surgical Technique

SHAWN W. O'DRISCOLL, PH.D., M.D.

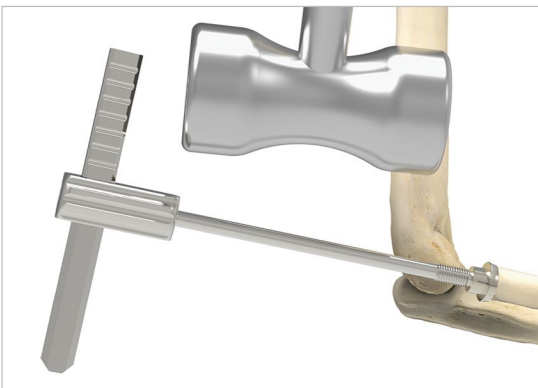


1 HEAD REMOVAL

To remove the radial head prosthesis from the standard stem, place an osteotome in the Morse taper gap between the head and the stem and tap with a mallet.

If removing a +0 mm collar standard stem (TR-SXX00-S) where there is no Morse taper gap, attach a vice grip to the head and then attach a slap hammer to the vice grip. Use the slap hammer to separate the implant head from the stem.

To remove the radial head prosthesis from a long stem (TR-SLXX-S), use the same vice grip technique as above.



2 STEM REMOVAL

To remove a standard stem or a long stem from the canal, thread the ARH Removal Tool Shaft (80-2018) in to the stem. Insert the Cross Bar (80-1771) through the handle of the ARH Removal Tool Shaft. Using a mallet, tap the cross bar until the stem is removed from the canal.

Ordering Information

Head Implants

20.0 mm Head, Left	TR-H200L-S
22.0 mm Head, Left	TR-H220L-S
24.0 mm Head, Left	TR-H240L-S
26.0 mm Head, Left	TR-H260L-S
28.0 mm Head, Left	TR-H280L-S
20.0 mm Head, Right	TR-H200R-S
22.0 mm Head, Right	TR-H220R-S
24.0 mm Head, Right	TR-H240R-S
26.0 mm Head, Right	TR-H260R-S
28.0 mm Head, Right	TR-H280R-S

Standard Stem Implants

6.0 mm x 0.0 mm Stem	TR-S0600-S
6.0 mm x 2.0 mm Stem	TR-S0602-S
6.0 mm x 4.0 mm Stem	TR-S0604-S
6.0 mm x 6.0 mm Stem	TR-S0606-S
6.0 mm x 8.0 mm Stem	TR-S0608-S
7.0 mm x 0.0 mm Stem	TR-S0700-S
7.0 mm x 2.0 mm Stem	TR-S0702-S
7.0 mm x 4.0 mm Stem	TR-S0704-S
7.0 mm x 6.0 mm Stem	TR-S0706-S
7.0 mm x 8.0 mm Stem	TR-S0708-S

Standard Stem Implants (continued)

8.0 mm x 0.0 mm Stem	TR-S0800-S
8.0 mm x 2.0 mm Stem	TR-S0802-S
8.0 mm x 4.0 mm Stem	TR-S0804-S
8.0 mm x 6.0 mm Stem	TR-S0806-S
8.0 mm x 8.0 mm Stem	TR-S0808-S
9.0 mm x 0.0 mm Stem	TR-S0900-S
9.0 mm x 2.0 mm Stem	TR-S0902-S
9.0 mm x 4.0 mm Stem	TR-S0904-S
9.0 mm x 6.0 mm Stem	TR-S0906-S
9.0 mm x 8.0 mm Stem	TR-S0908-S
10.0 mm x 0.0 mm Stem	TR-S1000-S
10.0 mm x 2.0 mm Stem	TR-S1002-S
10.0 mm x 4.0 mm Stem	TR-S1004-S
10.0 mm x 6.0 mm Stem	TR-S1006-S
10.0 mm x 8.0 mm Stem	TR-S1008-S

Long Stem Implants

6 mm Morse Taper Long Stem	TR-SL06-S
8 mm Morse Taper Long Stem	TR-SL08-S
10 mm Morse Taper Long Stem	TR-SL10-S
12 mm Morse Taper Long Stem	TR-SL12-S

Ordering Information

Head Trials

20.0 mm Trial Head, Left	TR-TH20L
22.0 mm Trial Head, Left	TR-TH22L
24.0 mm Trial Head, Left	TR-TH24L
26.0 mm Trial Head, Left	TR-TH26L
28.0 mm Trial Head, Left	TR-TH28L
20.0 mm Trial Head, Right	TR-TH20R
22.0 mm Trial Head, Right	TR-TH22R
24.0 mm Trial Head, Right	TR-TH24R
26.0 mm Trial Head, Right	TR-TH26R
28.0 mm Trial Head, Right	TR-TH28R

Standard Stem Trials

6.0 mm x 0.0 mm Trial Stem	TR-TS60
6.0 mm x 2.0 mm Trial Stem	TR-TS62
6.0 mm x 4.0 mm Trial Stem	TR-TS64
6.0 mm x 6.0 mm Trial Stem	TR-TS66
6.0 mm x 8.0 mm Trial Stem	TR-TS68
7.0 mm x 0.0 mm Trial Stem	TR-TS70
7.0 mm x 2.0 mm Trial Stem	TR-TS72
7.0 mm x 4.0 mm Trial Stem	TR-TS74
7.0 mm x 6.0 mm Trial Stem	TR-TS76
7.0 mm x 8.0 mm Trial Stem	TR-TS78

Standard Stem Trials (continued)

8.0 mm x 0.0 mm Trial Stem	TR-TS80
8.0 mm x 2.0 mm Trial Stem	TR-TS82
8.0 mm x 4.0 mm Trial Stem	TR-TS84
8.0 mm x 6.0 mm Trial Stem	TR-TS86
8.0 mm x 8.0 mm Trial Stem	TR-TS88
9.0 mm x 0.0 mm Trial Stem	TR-TS90
9.0 mm x 2.0 mm Trial Stem	TR-TS92
9.0 mm x 4.0 mm Trial Stem	TR-TS94
9.0 mm x 6.0 mm Trial Stem	TR-TS96
9.0 mm x 8.0 mm Trial Stem	TR-TS98
10.0 mm x 0.0 mm Trial Stem	TR-TS100
10.0 mm x 2.0 mm Trial Stem	TR-TS102
10.0 mm x 4.0 mm Trial Stem	TR-TS104
10.0 mm x 6.0 mm Trial Stem	TR-TS106
10.0 mm x 8.0 mm Trial Stem	TR-TS108

Long Stem Trials

6 mm Trial Morse Taper Long Stem, Left	TR-TSL06L
8 mm Trial Morse Taper Long Stem, Left	TR-TSL08L
10 mm Trial Morse Taper Long Stem, Left	TR-TSL10L
12 mm Trial Morse Taper Long Stem, Left	TR-TSL12L
6 mm Trial Morse Taper Long Stem, Right	TR-TSL06R
8 mm Trial Morse Taper Long Stem, Right	TR-TSL08R
10 mm Trial Morse Taper Long Stem, Right	TR-TSL10R
12 mm Trial Morse Taper Long Stem, Right	TR-TSL12R

Instruments

Standard Stem Reamer 6 mm	80-1606
Standard Stem Reamer 7 mm	80-1607
Standard Stem Reamer 8 mm	80-1608
Standard Stem Reamer 9 mm	80-1609
Standard Stem Reamer 10 mm	80-1610
Long Stem Reamer 6 mm	80-1706
Long Stem Reamer 8 mm	80-1708
Long Stem Reamer 10 mm	80-1710
Long Stem Reamer 12 mm	80-1712
6 mm Collar Reamer	TR-CRA06
7 mm Collar Reamer	TR-CRA07
8 mm Collar Reamer	TR-CRA08
9 mm Collar Reamer	TR-CRA09
10 mm Collar Reamer	TR-CRA10
Bone Graft Ratcheting T-Handle	BG-8043
Medium Ratcheting Driver Handle	80-0663
Head Impactor	TR-MS05
AT2 Screw Sizer	AT2-SMCZ
6.0 mm Stem Gauge Assembly	TR-TGA06
Height Gauge	TR-TG02
ARH Standard & Optional Trial Gauge	80-0832
5.5 mm Quick Release Awl	TR-0206
Long Stem Resection Guide	80-1512
Radius Retractor	80-1509

Instruments

ARH Removal Tool Shaft	80-2018
Cross Bar	80-1771
Morse Taper Impactor Block	80-1506
Morse Taper Long Stem Alignment Guide	80-2127
ARH Long Stem X-ray Template	90-0039

Tray

ARH Solutions Base	80-2000
ARH Solutions Lid	80-2001
ARH Upgrade Tray Instruments Level 1	80-2002
ARH Upgrade Tray Instruments Level 2	80-2003
ARH Standard & Optional Trial Caddy Base	80-0833
ARH Standard & Optional Trial Caddy Lid	80-0857

For ordering information, please contact your local Acumed sales representative, call 888.627.9957, or visit acumed.net.



ELB10-01-B

Effective: 10/2014

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