IDO025 Rev 0

Verso® Shoulder Surgical Technique

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Disclaimer

The following are the opinions and surgical practice of Professor Ofer Levy, MD, MCh(Orth), FRCS, Consultant Orthopaedic Surgeon at the Reading Shoulder Unit, the Royal Berkshire Hospital and Berkshire Independent Hospital, Reading, England, U.K. and not Innovative Design Orthopaedics Ltd.
This operative technique was written in conjunction with Professor Ofer Levy at the Reading Shoulder Unit, Reading, England, U.K.
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CONTENTS

The Verso® Shoulder: 2-7 years Results

Does Reverse Shoulder Need a Stem? Two to Seven Years Follow Up with Stemless Reversed Shoulder Prosthesis

Ofer Levy, Ehud Atoun, Ali Narvani, Ruben Abraham, Nir Hous, Tirtza Even, Jai Relwani, Stephen Copeland, Giuseppe Sforza, Reading, United Kingdom

Podium Presentation, American Shoulder and Elbow Surgeons (ASES) 2012 Annual Meeting, Sea Island, Georgia, October 11-14, 2012

Poster P308, The American Academy of Orthopaedic Surgeons (AAOS) 2013 annual meeting, Chicago, IL, USA.

Podium Presentation, 12th International Congress of Shoulder and Elbow Surgery (ICSES 2013), April 10th - 12th, 2013, in Nagoya, Japan.

INTRODUCTION: In recent years, there is a trend, when using anatomical prosthesis, towards resurfacing and stemless prostheses. The results with the anatomical stemless implants seem to compare favorably with the results with the stemmed anatomical prosthesis, while avoiding intraoperative and post operative complications related to the stem. Revision surgery pose a potential serious problem in stem removal.
A vertical osteotomy is frequently necessary, which has considerable morbidity and may present with severe bone loss.
Reverse shoulder replacements are gaining popularity in recent years with good results. However, high complication rate, high incidence of glenoid notching and significant reoperation rate with stemmed prostheses are of concern. We have been using a novel design of stemless reversed prosthesis that differs from all other known implants. We report the two to seven years results with the Verso® a different novel design of reversed prosthesis: stemless prosthesis, bone preserving, with metaphyseal fixation.

METHODS: Between 2005 to 2010, 98 patients were operated for severe cuff deficiency and arthritis with stemless reversed total shoulder prosthesis. There were 20 males and 78 females. The mean age at surgery was 74.4y (range 38-93y). Sixty-five with cuff arthropathy, 12 fracture sequelae,13 rheumatoid arthritis, three failed RC repair, three for loosening of anatomical prosthesis and two for acute trauma. Seventeen of these patients were operated as revision arthroplasty.

RESULTS: All patients had good pain relief and were satisfied with their shoulder.
Patients' satisfaction improved from 0.8/10 pre op to 8.5/10 post op. Mean Constant Score improved from 14 pre op to 59 at last follow up (age/sex adjusted: 21 to 86 ($p<0.0001$)). The mean range of movement improved to 128.5° elevation, 50.8° ER and 64.6° IR. Radiographic analysis showed mild glenoid notching (grade 1 or 2) in 21 patients that appeared only after three to four years after surgery. Nineteen of these were non progressive with sclerotic margin. Only three cases of grade 3 glenoid notching. No lucencies were seen around the implants and no signs of stress sheilding.

CONCLUSION: This different design, without stem, shows encouraging excellent mid-term results with excellent pain relief and restoration of good active range of motion and good shoulder function.
Significant improvement in patients' satisfaction score. The new design principles seem to result in improved rotational movements, reduction in complications and their severity and low incidence of glenoid notching.
It seem that there is no need for stem in reverse total shoulder replacement as well. With this bone preserving procedure, all options remain open for future surgery if deemed necessary as bone stock is preserved and therefore this prosthesis may be used in younger patients as well.

Further references:

1. Primary stability in reversed-anatomy glenoid components
A R Hopkins and U N Hansen* Proceedings of the Institution of Mechanical Engineers, Part H: Journal of Engineering in Medicine 2009 223: 805-812.

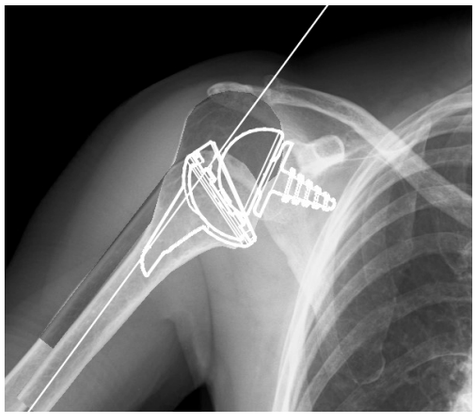
2. 2-4y results of stemless-metaphyseal reversed prosthesis for arthropathy with severe cuff deficiency
O.Levy, N. Hous, A. Narvani, R. Abraham, J. Relwani, T. Even, S. Copeland, Reading, United Kingdom
Podium Presentation 316 The American Academy of Orthopaedic Surgeons (AAOS) 2010 Annual Meeting, New Orleans, USA.

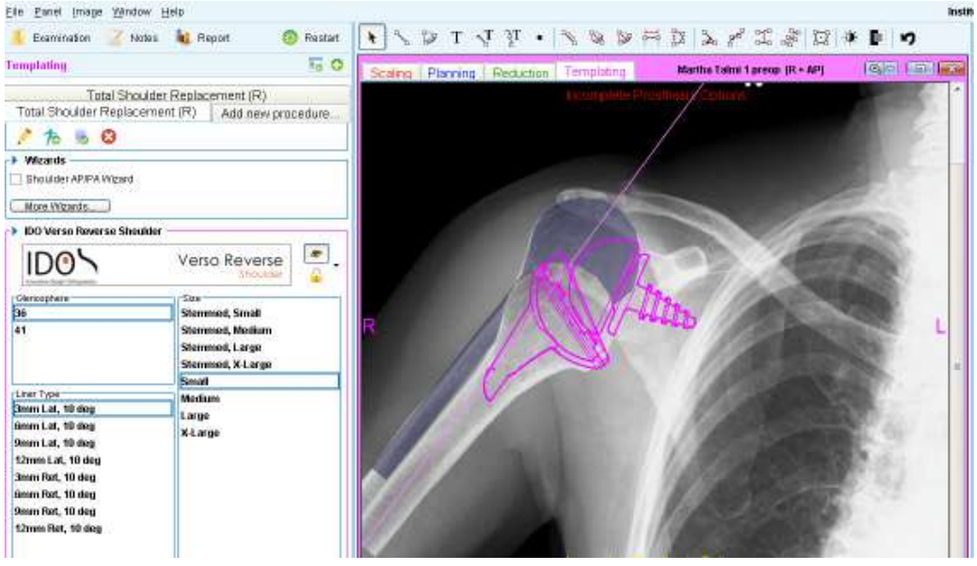
3. The Verso – bone preserving reverse geometry shoulder system – preliminary results
Ofer Levy, Stephen Copeland, Paul Smirthwaite
10th International Congress of Shoulder and Elbow Surgery, ICSS, September 16-20, 2007
Costa do Sauípe, Bahia, Brazil.

4. Early results of Verso® inverse polarity shoulder replacement for rotator cuff arthropathy
Paraskumar Mohanlal, Amit Tolat (United Kingdom)
Seventh SICOT/SIROT Annual International Conference, Gothenburg, Sweden, 2010.

Pre-Operative Planning and Templating

Radiographic pre-operative planning and templating is recommended for assessing implant sizes and formulating a surgical plan.
The planning and templating can be performed using X-ray films and transparent templates, or using computerised template software integrated with the PACS system using digital images.



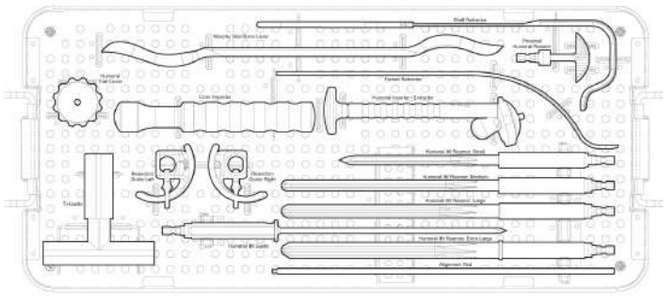


It is advisable to perform a pre operative 3D volumetric reconstruction CT scan of the shoulder, to assess the remaining bone stock, any significant deformity, the rotator cuff status and muscle fatty degeneration.

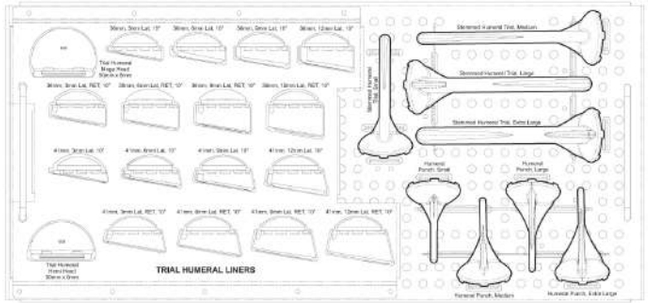
Sets Tray Configuration

Verso Shoulder Humeral Set

Lid

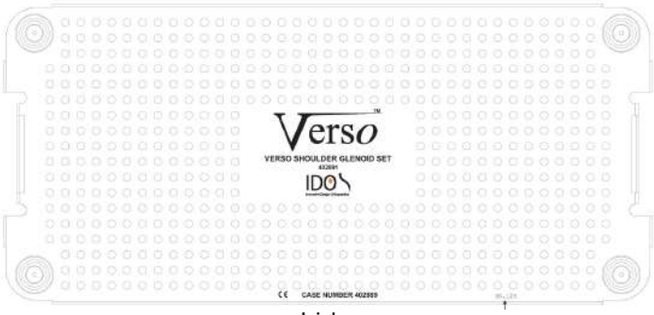


Lower Tray



Upper Tray

Verso Shoulder Glenoid Set



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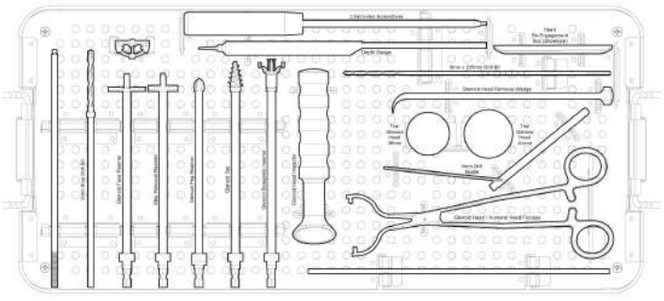

Tray

Patient Positioning

The patient should be placed in a semi sitting or beach chair position at about 45° of head-up tilt, with the head on a neurosurgical headpiece and the arm on a short arm board attached to the side of the operating table.
(Figure 1)

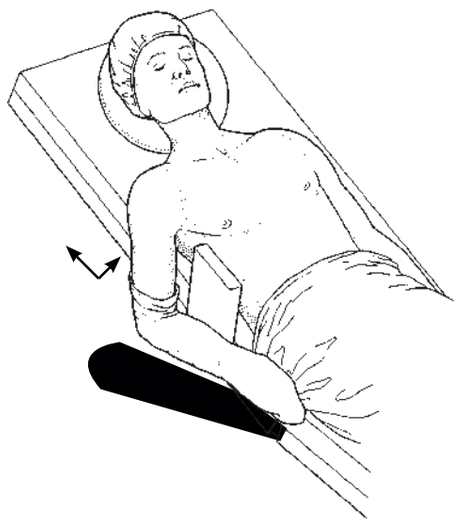

Figure 1

With the patient close to the edge of the table, a short arm board can be used for hyperextension of the arm during surgery and to allow delivery of the humeral head through the surgical window, therefore facilitating the insertion of the humeral component. The shoulder blade is best stabilised by placing a small (500ml) plastic infusion bag or a sandbag under the medial border of the scapula.

Routine antiseptic preparation of the skin and of the whole of the arm is carried out. The preparation is continued as far proximally as the ear.
The preparation should also be carried out as far medially as the midline anteriorly and as far as the infusion bag or sandbag posteriorly. The forearm and arm should be covered with a sterile stockinette and either an upper limb isolation drape or a “U” drape should be used to provide a safe sterile field. An adhesive plastic sterile drape is then applied and will ensure the drapes do not “migrate” during the operation.

Surgical Approach - **Option A**

Antero-Superior approach (Neviaser-Mackenzie)

Access

This approach provides exposure of the gleno-humeral joint, the humeral head and the tuberosities, as well as exposure of the acromion and AC joint.

Incision

The skin incision extends distally in a straight line from just posterior to the acromioclavicular joint, for a distance of 9cm. (Figure 2)

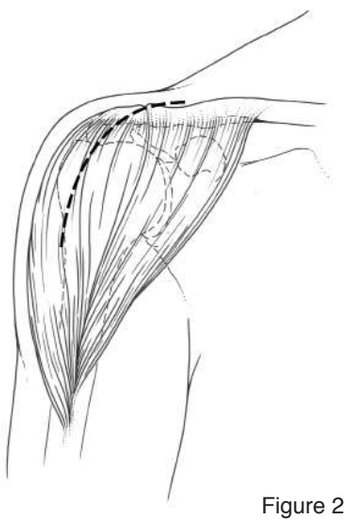

Figure 2

Approach

The anterior deltoid fibres are split for a distance of not more than 6cm, and a loose No. 1 stay suture is placed in the distal end of the split to prevent further extension and possible injury to the axillary nerve. The superior acromioclavicular ligament is elevated subperiostally to expose the AC joint. The acromial attachment of the deltoid is lifted with an osteo-periosteal flap to expose the anterior acromion. (Figure 3)

Note: To avoid injury to the axillary nerve
The nerve should lie distal to the reflecion of the bursal pouch . Use your index finger to check the reflecion of the pouch. If the incision ends above the reflecion, the nerve is safe .

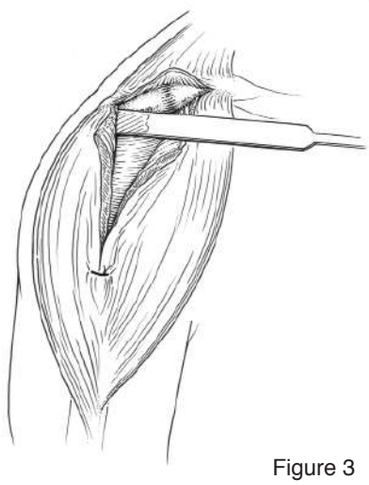

Figure 3

An anterior acromioplasty according to the technique of Neer is performed. Excision of the lateral end of the clavicle (approx 0.5cm) considerably enhances the exposure.

As there is no rotator cuff, the humeral head will be found directly under the deltoid muscle. The shoulder is dislocated anteriorly and superiorly. (Figure 4)

Note: Murphy Skid
A Murphy skid can be used to assist dislocation of the humeral head. The head can now be presented through the "surgical window".

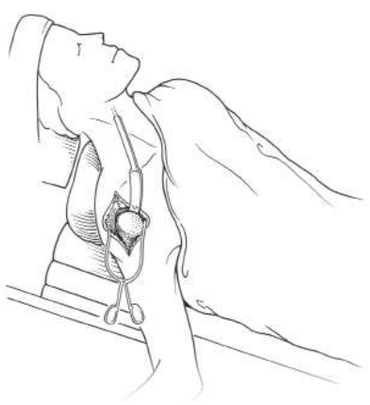

Figure 4

If remnants of the subscapularis or supraspinatus/ Infraspinatus are present they should be detached and tagged with stay sutures for reattachment at the end of the procedure.

Surgical Approach - **Option B**

Deltopectoral approach

Access

This approach provides exposure of the front of the gleno humeral joint, the upper humeral shaft and the humeral head.

Incision

A 15 cm incision is made from the clavicle down across the tip of the coracoid and continued in a straight line to the anterior border of the insertion of the deltoid. (Figure 5)

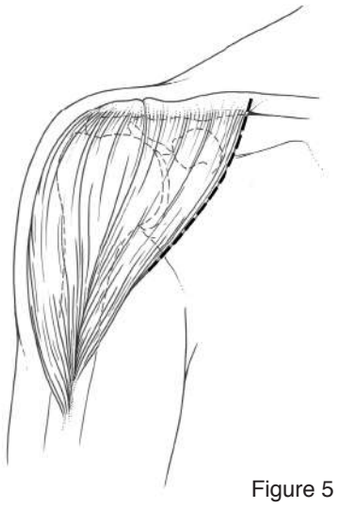

Figure 5

Approach

The cephalic vein is mobilised laterally in the deltopectoral groove. The vein is retracted laterally with the deltoid. The arm is abducted 40° to 60°. The clavipectoral fascia is incised and the subacromial space is cleared. At this stage improved exposure will be obtained by dividing the proximal 2 cm of the insertion of pectoralis major. (Figure 6)

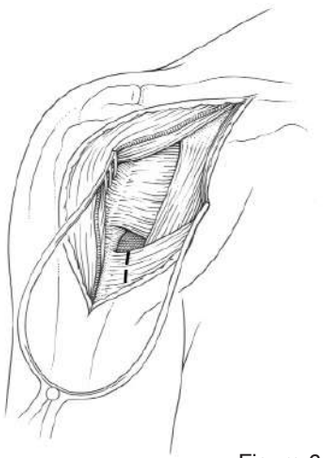

Figure 6

The shoulder is externally rotated to facilitate coagulation of the anterior circumex humeral vessels. If there is any residual subscapularis at this stage it can be marked with a stay suture, (Figure 7) detached and then reattached at the end of the procedure.

The joint capsule is then released anteriorly and inferiorly whilst taking care to protect the axillary nerve with a blunt elevator where it passes through the quadrilateral space. The glenohumeral joint may now be dislocated anteriorly.

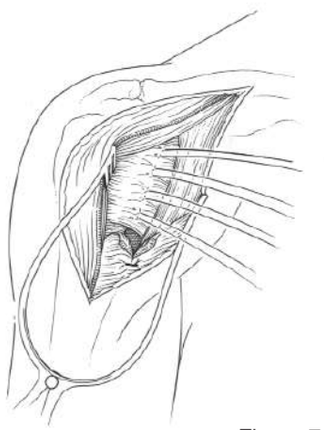

Figure 7

Note: Murphy Skid
A Murphy skid can be used to assist dislocation of the humeral head. The head can now be inserted through the "surgical window".

Humeral Preparation

The entry point for the humeral intra-medullary (IM) guide is generally superior to the humeral greater tuberosity and posterior of the bicipital groove. (Figure 8)

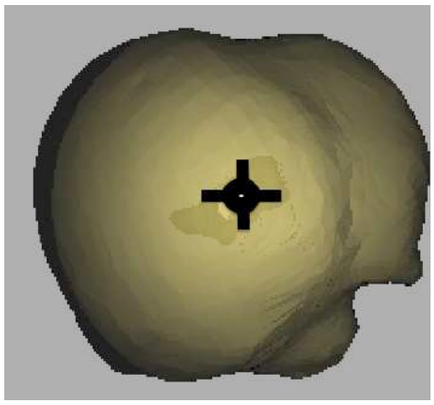

Figure 8

With the humeral intra-medullary guide located in the centre of the humeral canal, the humeral resection guide is then placed over the rod and seated onto the humeral head. The guide is secured using the thumb screw. (Figure 9)

The version alignment rod is attached to the intra-medullary guide and aligned with the forearm to provide 30° of retroversion.

Figure 9

A standard oscillating saw blade is placed in the slot of the humeral resection guide and the first part of the resection is made.
The guide, along with the intra-medullary guide and version rod are removed and the resection of the humeral head is completed. Around 20mm of the humeral head should be removed. (Figure 10)

If needed, according to the surgeon preplanning or intra-operative decision, an additional 5mm of the humeral head can be resected by placing the oscillating saw against the inferior aspect of the resection guide.

Figure 10

Humeral Preparation (Continued)

The proximal humerus is now prepared to receive the humeral shell implant.

The size of the humeral shell can be determined using pre-operative templates or intraoperatively by inserting the humeral punches sequentially until optimum fit and stability is achieved. (Figure 11).

The largest size of humeral punch which sits within the cortical bone should be selected.

Note: Directing the humeral punch
Ensure that the humeral punch is directed into the hole previously made with the intramedullary guide and that it is positioned centrally within the intra medullary canal.

Figure11

The humeral punch is impacted using the humeral inserter/extractor until the fins and spherical underside of the punch are within the bone. If the punch will not seat fully at that stage the pressure of the forked retractor during the glenoid preparation will aid its fixation into the humerus. The spherical undersurface of the humeral component is common to all sizes.
The humeral inserter/extractor is then detached, leaving the punch in situ as a protector during the glenoid preparation.

Note: In cases of extremely hard bone
If the bone is very hard and it is felt that further impaction may damage the cortical bone then a proximal humeral reamer can be used free hand to assist in creating the spherical concavity (Figure 11A)

Figure 11A

Figure 12

The Humeral punch (black) cover is placed on top of the punch. (Figure 12).

Whilst the glenoid is being prepared, the proximal humerus is depressed. With the Humeral punch (black) cover in place, a bone spike is first used to push the humerus down and assist in performing a thorough release of the capsule and labrum around the glenoid. The forked retractor is then introduced and used to push the humerus down allowing good “en face” access to the glenoid. The constant pressure of the forked retractor on the humeral shell while preparing the glenoid further impacts the cancellous bone of the proximal humerus under the shell and creates good bone impaction with gentle continuous pressure (Figure 13).

Note:
After insertion of the forked retractor underneath the inferior glenoid, bring the arm in elevation to bring the top of the humeral shell parallel to the forked retractor and than depress the humerus down.

Figure 13

Glenoid Preparation

Note:
The instruments for glenoid preparation are laid out in the tray in their natural sequence of use from left to right.

With the humeral punch in place as a protector with the Humeral punch (black) cover on, the glenoid can then be prepared. The proximal humerus is depressed, with the Humeral punch (black) cover in place, a bone spike is first used to push the humerus down. A thorough release of the capsule and labrum around the glenoid is performed with a scalpel and a periosteal elevator. The forked retractor is introduced pushing the humeral head inferiorly and allowing good “en face” access to the glenoid (Figure 14).

Note: Important - glenoid access
To allow better access for glenoid prepartion a forked retractor is used to expose the glenoid and depress the humerus . The retractor can be positioned either anteriorly or posteriorly.

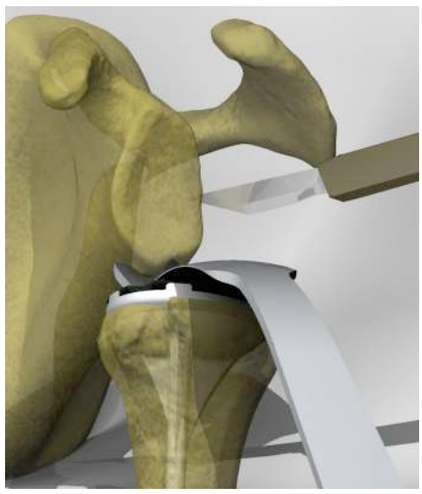

Figure 14

Drilling central drill hole:

Free hand drilling:
Using the diathermy probe, a circle is drawn in the lower part of the glenoid. A horizontal and vertical line that crosses the centre of the circle is drawn. The 5mm stop drill bit should be aimed at the centre of the circle (the crossing of the two lines) aimed cephalad 5°-10°. It is good practice to introduce a bone spike anterior to the glenoid before drilling to assess the glenoid neck direction (Figure 15). Both cortices should be penetrated.

Figure 15

Glenoid Preparation (Continued)

The glenoid face reamer is then connected to a power drill. The small spike on the face of the glenoid face reamer is inserted into the drill hole and used to ream the glenoid face. There is a depth stop control on the reamer which ensures a maximum of 2 mm is removed (Figure 17).

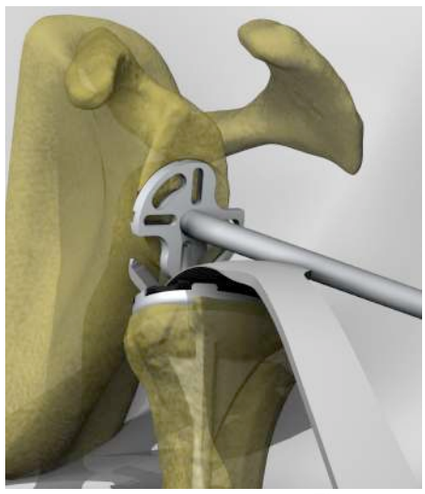

Figure 17

The glenoid face reamer is removed and the remaining central portion of bone is cut away using the step removal reamer connected to a power drill (Figure18).

The surgeon may repeat the above stages again if more bone needs to be removed. Finally, any peripheral osteophytes or uncut bone may be manually trimmed with standard rongeurs.

The central glenoid hole is now enlarged using the glenoid peg reamer connected to a power drill. The burr should be only inserted until the collar of the burr is in line with the bone (Figure 19).

The glenoid tap is then attached to the T-handle and screwed carefully by hand into the hole until all the threads are within the bone and the step is level with the bone (Figure 20).

Note: Important - Glenoid Tap
Proceed with gentle clockwise and anti-clockwise movements (1/2 clockwise turn and 1/4 anticlockwise turn sequentially) - be careful, the pressure exerted on the glenoid bone is very high.

Figure 18

Figure 20

Figure 19

Glenoid Baseplate Insertion

The glenoid is now prepared to receive the definitive glenoid baseplate.

The glenoid baseplate is then loaded onto the glenoid baseplate inserter attached to the T-handle. It is screwed gently into the tapped hole until the collar is in contact with the bone face. Ensure that one of the peripheral screw holes is lying superiorly (Figure 21).

The peripheral titanium screws are now inserted. This is performed by first placing the glenoid 3mm drill guide onto the chosen hole in the glenoid base plate. The glenoid 3mm drill bit attached to a standard powered drill, is then inserted through the guide and used to drill through the bone (Figure 22).

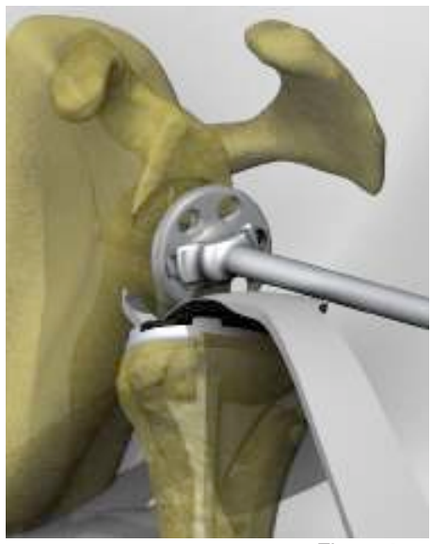

Figure 21

The glenoid 3mm drill bit has depth marks to determine the length of peripheral screw required. A depth gauge is also provided to measure the required screw length.

The appropriate length of titanium screw is then loaded onto the screwdriver and the screw head is seated within the collar on the glenoid base plate.

The above sequence is then repeated to insert another titanium screw into one of the inferior screw holes (Figure 23).

Figure 22

Note: Important
In case of asymmetric glenoid bone loss or intraoperative glenoid fracture, the glenoid baseplate can be used for fixation, using more screws accordingly.

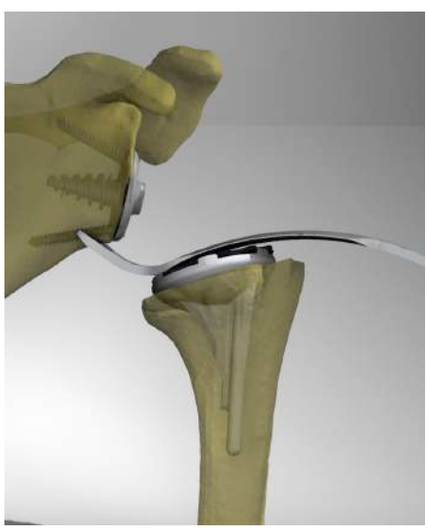

Figure 23

Trial Glenoid Head Insertion

The Humeral punch (black) cover is removed from the humeral punch.

To allow enough space to insert the trial glenoid head, the patient's arm is slightly abducted by the assistant and distracted using the humeral shell retractor. The trial glenoid head is attached to the glenoid head forceps and inserted into the taper of the glenoid baseplate (Figure 24).

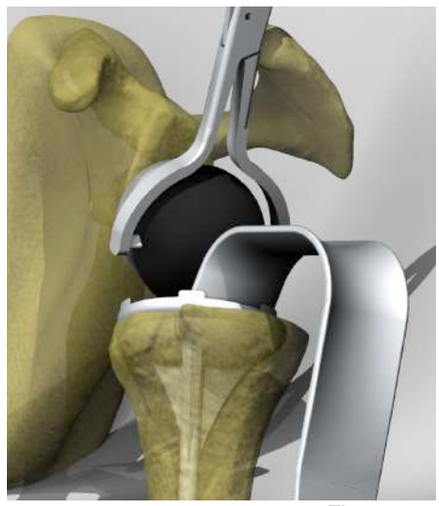

Figure 24

Trial Humeral Liner Insertion and Trial Reduction

The punch is dislocated laterally to the glenoid head and the glenoid head is protected from scratches using the head re-engagement tool (shoehorn) (Figure 25).

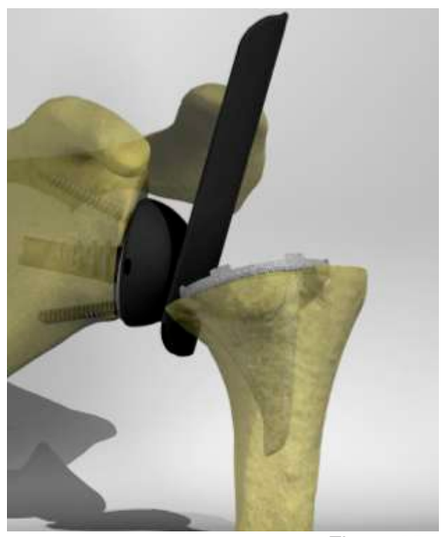

Figure 25

Trial humeral liners can then be inserted and assessed for fit and range of motion (Figure 26).

The trial liner can be dialled into place to find the best liner size (colour coded) and position, usually it should be at 30^0 of retroversion, where the black line mark on the liner aligns with the central black line marking on the back rim of the shell. It can be dialed either way to achieve the best match. (Figure 27)

The joint is reduced and assessed for stability and range of motion.

Figure 26

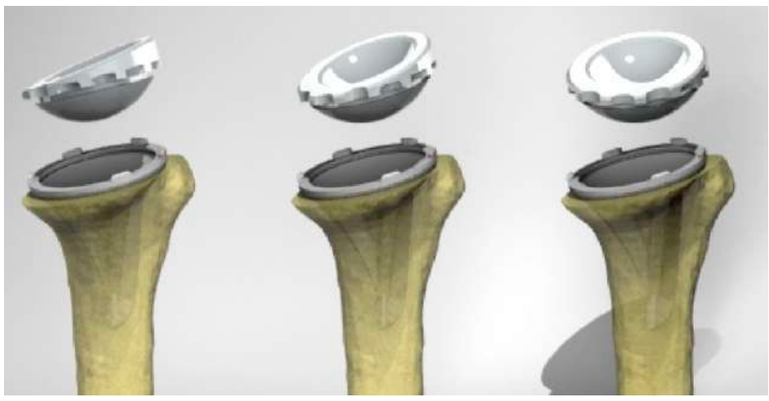

Figure 27

The joint is dislocated using the head re-engagment tool (shoehorn)

The glenoid head removal wedge is used to remove the trial liner by inserting the tip of the wedge between the liner and the punch, avoiding torque between the punch and the bone (Figure 28).

Note: Important
Use the glenoid head removal wedge to remove the trial liner by inserting the tip of the wedge between the liner and the shell, avoiding torque between the shell and the bone (Figure 28).

The trial glenoid head should be removed at this stage using the glenoid head removal wedge by inserting the tip of the wedge between the trial glenoid head and the baseplate.

Figure 28

Humeral Stemless Option: Shell Insertion

The humeral punch is now removed using the humeral inserter/extractor and the matching size of humeral shell is fitted to the humeral inserter/extractor and impacted into place (Figure 29-30), with counter pressure provided under the elbow by the assistant.

Note: Important
The humeral inserter should be in line with the humeral shaft to avoid varus /valgus insertion of the humeral component.

If there are deficiencies or poor bone quality or the shell appears unstable, morselized bone from the resected humeral head can be used as autograft to improve the bone quality of the proximal humerus and improve the immediate press fit of the humeral shell. If there is not enough autograft, bone graft substitute in the form of TCP granules or putty, mixed along with the patient's blood, can be used as graft.

Figure 29

Note: Important
Bone graft impaction is highly recommended at this stage in all the cases. You may use the punch to achieve better impaction before implanting the definitive humeral shell.

The humeral inserter/extractor is then unscrewed from the humeral component, while the inserter is held firm, to avoid torque on the shell-bone interface, leaving the implant in situ.

Figure 30

Note: Important
As this prosthesis is metaphyseal, the surgeon should avoid any toggle movement that will loosen up the immediate press fit fixation. Therefore, the surgeon should hold firmly the inserter while loosening the fixation screw to the shell.

Definitive Glenoid Head Insertion

To allow enough space to insert the glenoid head, the patient's arm is slightly abducted by the assistant and distracted using the curved humeral shell retractor. The glenoid head is attached to the glenoid head forceps and inserted into the taper of the glenoid baseplate (Figure 31), and impacted using the concave glenoid head impactor (Figure 32).

Note: Important
Ensure that the base plate taper is dry before impacting the definitive glenoid head.

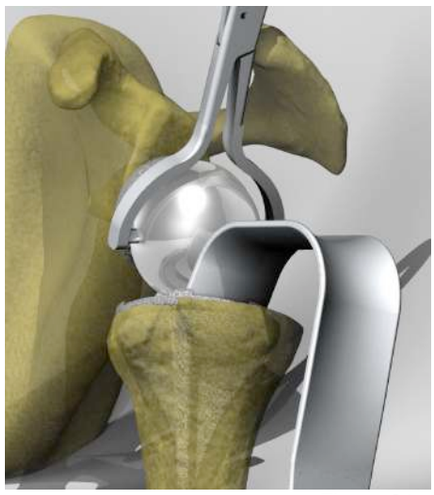

Figure 31

Note: Important
When inserting the glenoid head, check that there is no interposed tissue between the glenosphere and the baseplate, before impacting the glenoid head.

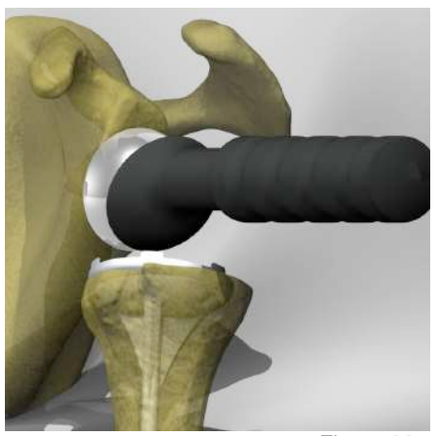

Figure 32

Definitive Humeral Liner Insertion

The shell is dislocated laterally to the glenoid head and the glenoid head is protected from scratches using the re-engagement tool (shoehorn) (Figure 33).

A trial liner can be inserted at this stage to asses the best size, position (version), stability and range of motion after trial reduction.
The joint is dislocated using the head re-engagement tool (shoehorn)

The trial liner is removed using the glenoid head removal wedge as described in page 13 (Figure 28)

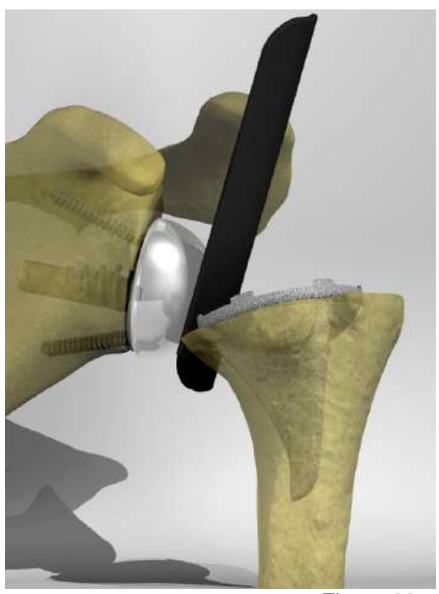

Figure 33

The definitive humeral liner size (colour coded) can be dialed into the best position, selected with the trial liner. Usually it should be at 30^0 of retroversion, where the black line mark on the liner aligns with the central black line marking on the back rim of the humeral shell (Figure 34,35). The liner is impacted and locked into the locking ring mechanism (Figure 34, 35), using the humeral liner impactor.

The Joint is reduced and assessed for stability and range of motion.

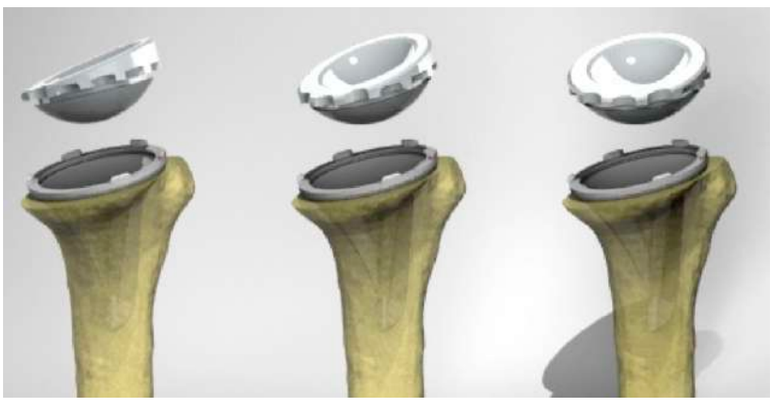

Figure 34

Figure 35

Note: Important
The definitive liner can be dialled into the best position and correct any version problem even after all the metal components have been implanted.

This simple yet sophisticated and versatile feature, allowing minor adjustments of the prosthesis even after implantation of the metal components is a unique to the Verso prosthesis.

Note: Important
Should it be necessary to remove the definitive liner at any stage, the Verso head removal wedge (402848) or a thin osteotome should be fitted carefully between the liner and the rim of the Verso shell and the liner loosened circumferentially and removed. This procedure may damage the locking ring, so prior to inserting a new liner a new universal locking ring (105444-3) should be fitted into the circumferential recess in the proximal part of the humeral shell.

Stemmed Humeral Component Option:

In Cases of Fractures, Nonunions and Revisions

Stem Preparation and Insertion

This can be initiated in two options:
In cases of fracture of the proximal humerus -
start with medullary canal reaming.

Otherwise, once the desired humeral punch has been seated and the denitive glenoid baseplate inserted, you can begin preparation for the humeral stem.

Insert the smallest humeral intramedullary reamer (IM) into the canal and ream sequentially using the T-handle(Figure 36). Depending on the diameter of the medullary canal and the reamer size used with some purchase of bone, the identical size trial stemmed implant must be inserted.

The stemmed humeral trial can now be inserted using the humeral inserter/extractor (Figure 37).

Align the forearm with the version alignment rod at 30° of retroversion and insert the stemmed humeral trial.
Insert the trial glenoid head, followed by the trial liner at the same way as described for the stemless implant (pages 15-16) and reduce the joint to assess range of movement and stability.

Figure 36

Remove the trial glenoid head and liner.

Note: Important
Bone graft impaction is highly recommended at this stage in all the cases. You may use the punch to achieve better impaction before implanting the definitive stemmed humeral shell.

Align the forearm with the version alignment rod at 30° of retroversion. Insert and impact the denitive stemmed humeral shell using the humeral inserter/extractor.
The humeral inserter/extractor is then unscrewed from the stemmed humeral component, while the inserter/extractor is held firm, to avoid torque on the shell-bone interface, leaving the implant in situ.

Figure 37

Acute Proximal Humeral Fractures

The low profile of the proximal stemmed Verso prosthesis is ideal for fixation of the tuberosities to the hydroxyapatite coated proximal implant (Figure 38).

The stemmed humeral shell prosthesis is designed to be implanted cementless.

However, in cases of fractures, where the proximal immediate fixation is compromised, a small amount of cement can be used distally on the smooth grooved part of the stem to provide immediate stability.

Figure 38

Humeral Hemi Arthroplasty Option

Indications for use:

Massive glenoid erosion, fracture or limb salvage, where there is insuficient bone stock to successfully implant a glenoid component.

Figure 39

The insertion of humeral mega head or humeral hemi head (hemiarthroplasty) can be temporary or definitive (Figure 39).

There is an option to bone graft the glenoid, insert a humeral head (mega head or hemi head) for six months until the bone graft consolidates and then revise with removal of the humeral head and insertion of a baseplate and a glenoid head components, creating a reverse shoulder replacement again.

The hemiarthroplasty can be left as the definitive option.

With the trial humeral component in situ, the trial humeral head can be inserted so that the castellations on the humeral shell engage with those on the trial head. The shoulder can now be reduced to assess stability and range of motion.

The definitive humeral shell can now be inserted following the instructions on pages 17.

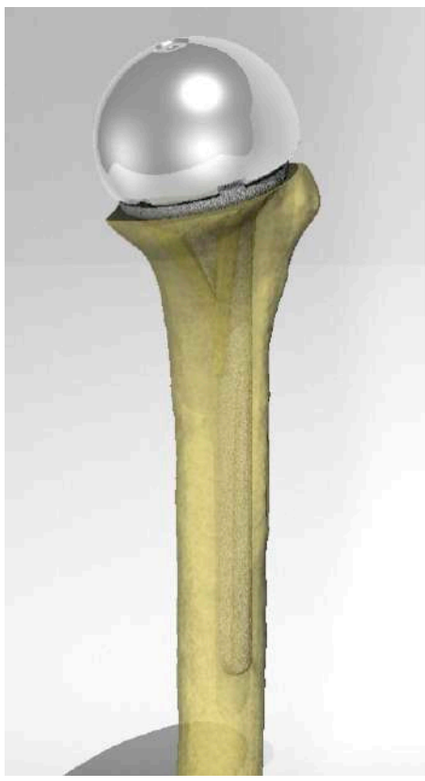

Figure 40

Once the correct size humeral head has been identified, and the definitive humeral shell component implanted, the definitive humeral head component can be inserted (Figure 40).

The central screw which secures the humeral head to the shell should be loaded into the top of the component and tightened using the 2.5mm hex screwdriver.

There are two humeral head size options:
•The Humeral Mega Head (50mm x 8mm) [124570]
•The Humeral Hemi Head (50mm x 0mm) [124569]

Closure

Antero-superior Approach (Neviaser-Mackenzie)

Any remaining subscapularis or infraspinatus tendons are reattached to the bone using No.5 (Non-absorbable) suture material (in an attempt “to close the book”).

The deltoid is reattached to the acromion with No. 5 non absorbable sutures through bone.

The deltoid split is approximated with No.1 absorbable suture.

Subcutaneous fat is opposed with absorbable sutures and appropriate skin closure undertaken with Intra-dermal continuous absorbable suture (No.3 Monocryl). (Figure 41).

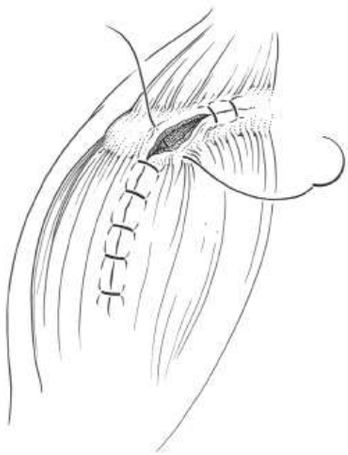

Figure 41

Deltopectoral Approach

Any remaining subscapularis or infraspinatus tendons are reattached to the bone using No.5 material (in an attempt “to close the book”).

The delto-pectoral interval is closed using absorbable sutures.

Subcutaneous fat is opposed with absorbable sutures and appropriate skin closure undertaken with Intra-dermal continuous absorbable suture (No.3 Monocryl).

Post Operative Management

The patient is placed in a sling with bodybelt and brachial plexus block analgesia used. Passive mobilising for the first 48 hours and passive assisted for five days. Active movements are then started as pain allows and the sling abandoned at three weeks. A standard stretching and strengthening programme is then undertaken.

Note: Important
In the first six weeks post op, the patients are advised that they should avoid putting weight through the arm, such as pushing themselves up from a chair. There is a risk of dislocation of the joint until the muscles are strong enough to control the movement of the shoulder.

The patients are instructed to start with the Reading Shoulder Unit Deltoid rehabilitation programme

Reference:
Levy at al., The role of anterior deltoid reeducation in patients with massive irreparable degenerative rotator cuff tear. J Shoulder Elbow Surg. 2008;17:863-870.

http://www.readingshoulderunit.com/patient-informaion/patient-information-leaflets

Ordering Information

Implant List

Product	Part Number	Description
	124512 124513 124514 124515	36mm, 3mm Lat, 10° Humeral Liner 36mm, 6mm Lat, 10° Humeral Liner 36mm, 9mm Lat, 10° Humeral Liner 36mm, 12mm Lat, 10° Humeral Liner
	124517 124518 124519 124520	36mm, 3mm Lat, RET, 10° Humeral Liner 36mm, 6mm Lat, RET, 10° Humeral Liner 36mm, 9mm Lat, RET, 10° Humeral Liner 36mm, 12mm Lat, RET, 10° Humeral Liner
	124522 124523 124524 124525	41mm, 3mm Lat, 10° Humeral Liner 41mm, 6mm Lat, 10° Humeral Liner 41mm, 9mm Lat, 10° Humeral Liner 41mm, 12mm Lat, 10° Humeral Liner
	124527 124528 124529 124530	41mm, 3mm Lat, RET, 10° Humeral Liner 41mm, 6mm Lat, RET, 10° Humeral Liner 41mm, 9mm Lat, RET, 10° Humeral Liner 41mm, 12mm Lat, RET, 10° Humeral Liner
	124573 124574	36mm Dia Glenoid Head 41mm Dia Glenoid Head
	124572	Glenoid Baseplate
	124564 124565 124566 124567 105444-3	Small Humeral Shell Medium Humeral Shell Large Humeral Shell X-Large Humeral Shell Locking Ring
	124560 124561 124562 124563	Small Stemmed Humeral Shell Medium Stemmed Humeral Shell Large Stemmed Humeral Shell X-Large Stemmed Humeral Shell
	124569 124570	Humeral Hemi Head 50mmx0mm Humeral Mega Head 50mmx8mm
	113843 113844 113845 113846 113847 113848 113861 113862	Titanium Screw Low Profile 5x15mm Titanium Screw Low Profile 5x20mm Titanium Screw Low Profile 5x25mm Titanium Screw Low Profile 5x30mm Titanium Screw Low Profile 5x35mm Titanium Screw Low Profile 5x40mm Titanium Screw Low Profile 5x45mm Titanium Screw Low Profile 5x50mm

Ordering Information

Humeral Instrument Listing

Product	Part Number	Description
	402812	Verso® Trial Liner, 36mm, 3mm Lateral, 10°
	402813	Verso® Trial Liner, 36mm, 6mm Lateral, 10°
	402814	Verso® Trial Liner, 36mm, 9mm Lateral, 10°
	402815	Verso® Trial Liner, 36mm, 12mm Lateral, 10°
	402817	Verso® Trial Liner, 36mm, 3mm Lateral, Retentive, 10°
	402818	Verso® Trial Liner, 36mm, 6mm Lateral, Retentive, 10°
	402819	Verso® Trial Liner, 36mm, 9mm Lateral, Retentive, 10°
	402820	Verso® Trial Liner, 36mm, 12mm Lateral, Retentive, 10°
	402822	Verso® Trial Liner, 41mm, 3mm Lateral, 10°
	402823	Verso® Trial Liner, 41mm, 6mm Lateral, 10°
	402824	Verso® Trial Liner, 41mm, 9mm Lateral, 10°
	402825	Verso® Trial Liner, 41mm, 12mm Lateral, 10°
	402827	Verso® Trial Liner, 41mm, 3mm Lateral, Retentive, 10°
	402828	Verso® Trial Liner, 41mm, 6mm Lateral,Retentive, 10°
	402829	Verso® Trial Liner, 41mm, 9mm Lateral, Retentive, 10°
	402830	Verso® Trial Liner, 41mm, 12mm Lateral, Retentive, 10°
	402859	Verso® Humeral Liner Impactor
	402853	Verso® Humeral Resection Guide Left
	402854	Verso® Humeral Resection Guide Right
	406801	T-Handle
	402855	Verso® Humeral IM Guide
	402455	Verso® Alignment Rod

Ordering Information

Humeral Instrument Listing

Product	Part Number	Description
	402857	Verso® Humeral Inserter/Extractor
	402864 402865 402866 402867	Verso® Humeral Punch, Small Verso® Humeral Punch, Medium Verso® Humeral Punch, Large Verso® Humeral Punch, Extra Large
	402850	Verso® Shoulder Humeral (Punch) Trial Cover
	402879	Verso® Shoulder Proximal Humeral Reamer
	402875 402876 402877 402878	Verso® Humeral IM Reamer Small Verso® Humeral IM Reamer Medium Verso® Humeral IM Reamer Large Verso® Humeral IM Reamer Extra

Ordering Information

Humeral Instrument Listing

Product	Part Number	Description
	402860 402861 402862 402863	Verso® Shoulder Stemmed Humeral Trial Small Verso® Shoulder Stemmed Humeral Trial Medium Verso® Shoulder Stemmed Humeral Trial Large Verso® Shoulder Stemmed Humeral Trial Extra Large
	402869 402870	Verso® Trial Humral Hemi Head 50mm X 0mm Verso® Trial Humeral Mega Head 50mm X 8mm
	470243	Screwdriver Hex Head 2.5mm
	402856	Verso® Humeral Shell Retractor
	402851	Verso® Murphy Skid Type Bone Lever
	402852	Verso® Forked Retractor
	402888 402890	VERSO® HUMERAL INSTRUMENT CASE EMPTY VERSO® HUMERAL CASE WITH INSTRUMENTS

Ordering Information

Glenoid Instrument Listing

Product	Part Number	Description
	402834	Verso® Shoulder 5mm Stop Drill Bit
	402430	Verso® Shoulder Glenoid Face Reamer
	402838	Verso® Glenoid Step Removal Reamer
	402839	Verso® Glenoid Peg Reamer
	402840	Verso® Glenoid Tap
	402841	Verso® Glenoid Baseplate Inserter
	402844	Verso® Glenoid 3mm Drill Guide

Ordering Information

Glenoid Instrument Listing

Product	Part Number	Description
	402847	Verso® Glenoid Drill Bit 3mm X 225mm
	402845	Verso® Glenoid Depth Gauge
	402846	Verso® Glenoid Head/Humeral Head Forceps
	402873 402874	Verso® Trial Glenoid Head 36mm Verso® Trial Glenoid Head 41mm
	402849	Verso® Glenoid Head Impactor
	402848	Verso® Glenoid Head Removal Wedge
	402860	Verso® Shoulder Re-engagement Tool (Shoehorn)
	402889 402891	VERSO® GLENOID INSTRUMENT CASE EMPTY VERSO® GLENOID CASE WITH INSTRUMENTS

Notes

Notes