Glenoid Exposure System Simplified

GLOBAL ENABLE®

Surgical Technique

DePuy Synthes
PART OF THE JOHNSON & JOHNSON FAMILY OF COMPANIES
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GLOBAL ENABLE Retractors – Key Features

**Blunt Point Gelpi**

The Blunt Point Gelpi (2245-10-001) is a self-retaining retractor with blunted ends that retracts soft tissue. The Blunt Point Gelpi is used to control soft tissue throughout shoulder replacement surgery and is frequently used to open the deltopectoral interval.

![Blunt Point Gelpi](image)

**Reverse Hohmann**

The Reverse Hohmann (2245-10-040) is designed to protect soft tissue and neurovascular structures, specifically the axillary nerve, during recommended soft tissue releases. Additionally, it can be used to retract soft tissue and muscle in large patients.

![Reverse Hohmann](image)

**Anterior Glenoid Neck Retractor**

The Anterior Glenoid Neck Retractor is designed to (2810-17-000) protects the subscapularis and anterior capsule after the subscapularis tendon has been released. In larger patients, it can be used to protect the pectoral muscle and surrounding tissue.

![Anterior Glenoid Neck Retractor](image)

**Medium Acromial Retractor**

The Medium Acromial Retractor (2810-03-000) is designed to be used to control soft tissue in large patients as well as control and dislocate the humerus out of the shoulder joint before humeral head resection.

![Medium Acromial Retractor](image)
**Modified Sonnabend**
The Modified Sonnabend (2245-10-042). It is designed with a 6mm lip to retract the humerus posteriorly and inferiorly after humeral head resection. This offset increases access to the glenoid.

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**Proximal Humerus Spreader**
The Proximal Humerus Spreader (2245-10-100). The Proximal Humerus Spreader has a flat plate that rests on the humerus osteotomy surface and a saddle that is placed on the base of the corocoid. As the spreader is engaged it retracts the humerus posteriorly and inferiorly to the glenoid, increasing access to the glenoid.

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**Small Pectoral Retractor**
The Small Pectoral Retractor (2245-10-008) is designed to control and position the deltoid muscle laterally and superiorly. The Small Pectoral Retractor is used throughout the glenoid exposure process and is especially useful in large or muscular patients.

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**Forked Retractor**
The Forked Retractor (2307-86-002) is designed to increase access to the glenoid for patients with smaller anatomic features. The forks of the retractor are placed on the inferior/posterior wall of the glenoid and used to displace the humerus.
Key Exposure Steps

1. Deltopectoral Approach
2. Biceps Tenodesis
3. Axillary Nerve Protection
4. Subscapularis Tendon Release
5. Anterior and Inferior Capsule Release

6. Humeral Head Dislocation and Resection

7. Posterior Capsule Release

8. Final Glenoid Exposure

Option 1
Proximal Humerus Spreader

Option 2
Modified Sonnabend
A number of surgical techniques are available to inform a surgeon about the detailed methods for the variety of steps recommended for shoulder arthroplasty. This technique will focus on the key steps for optimal glenoid exposure.

**Patient Positioning, and Prep**

Place the patient in beach chair position. The involved shoulder should extend laterally over the edge of the table so the arm can be brought into full extension and adduction (Figure 1). This range of motion allows for optimal control of the humeral head throughout the procedure. An interoperative arm positioning device is recommended and is used to hold the arm position during the surgery. Placing and leaving the arm on a Mayo stand may lessen arm motion during surgery and inhibit glenoid exposure.
Surgical Technique

Deltopectoral Approach

GLOBAL ENABLE Instruments were designed to be used for both primary and reverse shoulder arthroplasty using a deltopectoral approach (Figure 2). As the deltopectoral interval is identified and separated, the Blunt Point Gelpi is used to separate and retract the deltoid and pectoralis major (Figure 3).

Figure 2

Figure 3
Biceps Tenodesis
The biceps tendon can limit glenoid exposure by acting as a tether. Tenodese the biceps tendon to soft tissue distal just distal to the bicipital groove (Figure 5). It should be done prior to resecting the proximal biceps thereby allowing the biceps to be tenodesed under its normal tension and length. The biceps tendon can be removed from the bicipital groove and released from its glenoid attachment to remove the portion proximal to the tenodesis site.
Axillary Nerve Protection

Use your finger to identify the axillary nerve, it is tensioned differently than the tissue surrounding it. Introduce a Reverse Hohmann above the latissimus dorsi tendon and below the joint capsule. This can be done by initial blunt dissection with a small Cobb elevator and a sponge (Figure 6). The Reverse Hohmann both protects the axillary nerve during capsule dissection and helps to define the inferior aspect of the joint.

Subscapularis Tendon Release

Internally rotate the arm to better visualize the lesser tuberosity and the subscapularis attachment site.

Introduce the oscillating saw or a sharp curved 1/2 inch osteotome at the interval created at bicipital groove and the insertion site of the subscapularis. Resect approximately 4-5 mm of the lesser tuberosity to include the entire insertion site footprint of the tendon. The osteotomy can be facilitated by passing a small hemostat through the rotator interval and use it to “hook” the subscapularis and anterior capsule as it inserts on the lesser tuberosity. A oscillating saw or osteotome can then be directed at the midpoint of the hemostat jaws. This will allow consistent resection of the lesser tuberosity and prevent removal of too much anterior humeral bone stock (Figure 7).
Anterior and Inferior Capsule Release

Using blunt dissection, the anterior capsule can be separated from the subscapularis (Figure 8). Release the coracohumeral ligament from the base of the coracoid.

Place the Anterior Glenoid Neck Retractor on the anterior rim of the glenoid and use it to retract and protect the subscapularis. Resect the anterior capsule in its entirety from the glenoid insertion site (Figure 9).

With the axillary nerve protected by the Reverse Hohmann, release the inferior capsule to the 6 o’clock position on the humeral neck. The capsule attaches to the humeral head at both the anatomic neck and the surgical neck of the humerus.

If exposure is compromised and the entire anterior/inferior capsule cannot be seen, then excision of the capsule should wait until after the humeral head is resected.

Note: Failure to sufficiently release the capsule from the humeral neck to its posterior inferior area will make it very difficult to expose the head and deliver it out of the wound. Additionally, insufficient release of the capsule will inhibit glenoid exposure.

Once the capsule is released, any inferior osteophytes should be removed. This can be performed with a rongeur or a curved osteotome. Inferior osteophytes can be better visualized by externally rotating the arm. Inferior osteophyte removal allows the identification and complete resection of the humeral head and optimizes glenoid exposure.
Humeral Head Dislocation

Remove the Anterior Glenoid Neck Retractor and place the Medium Acromial Retractor between the humeral head and the glenoid fossa and dislocate the humerus by externally rotating the arm (Figure 10).

Place a medium size retractor on the inferior part of the humeral head and continue to bring the arm into full external rotation. The entire humeral head should now be visible, with all capsular tissues removed from around the neck to provide optimal exposure (Figure 11).

Note: It is important to fully visualize the rotator cuff insertion site superiorly and posteriorly since this will identify the anatomic neck circumferentially and will permit the surgeon to resect the entire humeral head.

Humeral Head Preparation

Consult the surgical technique corresponding to the shoulder arthroplasty product you are using for details regarding humeral head resection and canal preparation.
Posterior Capsule Release

Before considering glenoid exposure for preparation of the glenoid, inspect the posterior aspect of the capsule and glenohumeral space. Place the Anterior Glenoid Neck Retractor on the anterior wall of the glenoid and retract the subscapularis and pectoralis. Then, place a cover plate over the humeral osteotomy surface to protect this bone surface (Figure 12).

Place the arm in a position so that the humeral osteotomy is parallel to the glenoid fossa. This is generally achieved with the forearm perpendicular to the floor with the humerus in slight abduction (Figure 13).
Laterally displace the proximal humerus to create a space between the osteotomy surface and the glenoid and place a lamina spreader onto the face of the glenoid and humeral osteotomy plate. Open the blades of the lamina spreader and have an assistant hold the retractor to prevent rotation (Figure 14).

To retract the superficial soft tissues, use the Blunt Point Gelpi and a Reverse Hohmann. The Reverse Hohmann is placed between the remaining inferior capsule and neurovascular structures – axillary nerve and posterior humeral circumflex vessels (Figure 15).

The interval between the humerus and glenoid to the back surface of the capsule can now be seen. The posterior capsule can then be released from the posterior glenoid rim (Figure 16). With the release of the posterior capsule, the humerus is no longer attached to the glenoid fossa and can be displaced posteriorly/inferiorly for optimal glenoid exposure.

**Note:** Any remaining capsular tissue may interfere with the placement of retractors on the posterior neck of the glenoid.

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**Excise Labrum**

With the lamina spreader in position, the posterior labrum and the remaining long head of the biceps can be seen and excised. Most importantly this step will allow for complete removal of the anterior/inferior capsule which allows identification and protection of the axillary nerve. Release of these tissues in this way allows for optimal exposure of the glenoid.
Final Glenoid Exposure

Two different glenoid exposure options are available when using the GLOBAL ENABLE System. Choose the option most suitable based on patient type, or surgical preference.

Option 1 – Normal Situations

The **Anterior Glenoid Neck Retractor** is placed over the anterior glenoid rim and is used to retract the subscapularis and the anterior soft tissues. The arm is then gradually positioned in extension, external rotation, and abduction (Figure 17). This positions the resected humeral head perpendicular to the face of the glenoid.

A **Proximal Humerus Spreader** is positioned with the saddle on the base of the coracoid and the cover plate on the resected surface of the humerus. When in position, the **Proximal Humerus Spreader** is opened and the humerus is displaced posteriorly and inferiorly. Combined, these two retractors provide access to the glenoid fossa for surface preparation with minimal retractor interference (Figure 18).

**Caution:** Failure to position the saddle of the Proximal Humerus Spreader at the base of the coracoid may lead to a coracoid fracture.
Option 2 – Challenging Situations

The Blunt Point Gelpi is used to retract the deltoid and pectoralis muscles. Place the Anterior Glenoid Neck Retractor over the anterior glenoid rim to retract the subscapularis and the anterior soft tissues. Place a cover plate on the resected proximal humerus. A Modified Sonnabend or a Forked Retractor is placed posterior to the glenoid rim and rests on the posterior glenoid wall.

The arm is then gradually positioned in slight extension, external rotation, and abduction while levering the posterior retractor pushing the humerus posterior to the glenoid (Figure 19). The cut surface of the humerus is perpendicular to the glenoid surface and posterior to the posterior glenoid rim. A Reverse Hohmann or Small Pectoral Retractor can be placed on the superior glenoid within the supraspinatus fossa to retract the superior part of the deltoid (Figure 20).

Note: Excessive abduction will cause the pectoralis and latissimus to tighten, which could potentially limit glenoid exposure.
## Ordering Information

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<th>Part Number</th>
<th>Description</th>
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