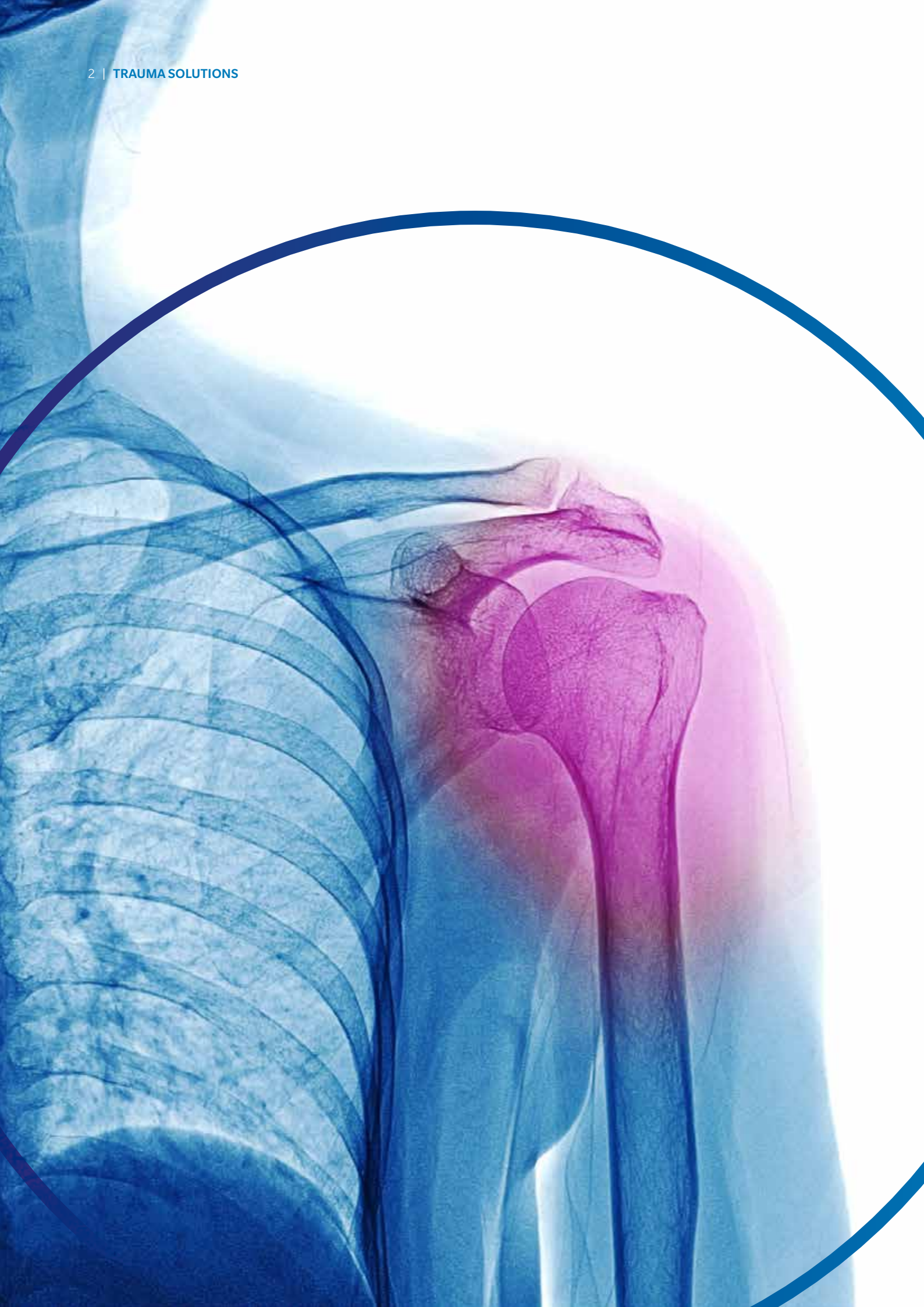


SHOULDER

TRAUMA SOLUTIONS





CONTENTS

Flowchart of Management	6
Proximal Humeral Fractures.....	7
Product Offering for Fracture Management.....	8
Product Features	
A.L.P.S.[®] Proximal Humerus	10
Affixus[®] Humeral Nail[®]	16
Hemi Arthroplasty and Reverse	20
Comprehensive Fracture Hemi	22
Comprehensive Reverse	24
Signature[™] ONE	26
MaxBraid Sutures and BroadBand[™] Tape	28

PROXIMAL HUMERUS FRACTURES

1 Part



Minimal Displacement

In case of a minimally or undisplaced fractures, the treatment is mostly nonoperative with short immobilisation in a sling followed by early exercises.



2 Part

II
Anatomical Neck



III
Surgical Neck



IV
Greater Tuberosity



V
Lesser Tuberosity



VI
Fracture Dislocation

Anterior



Posterior



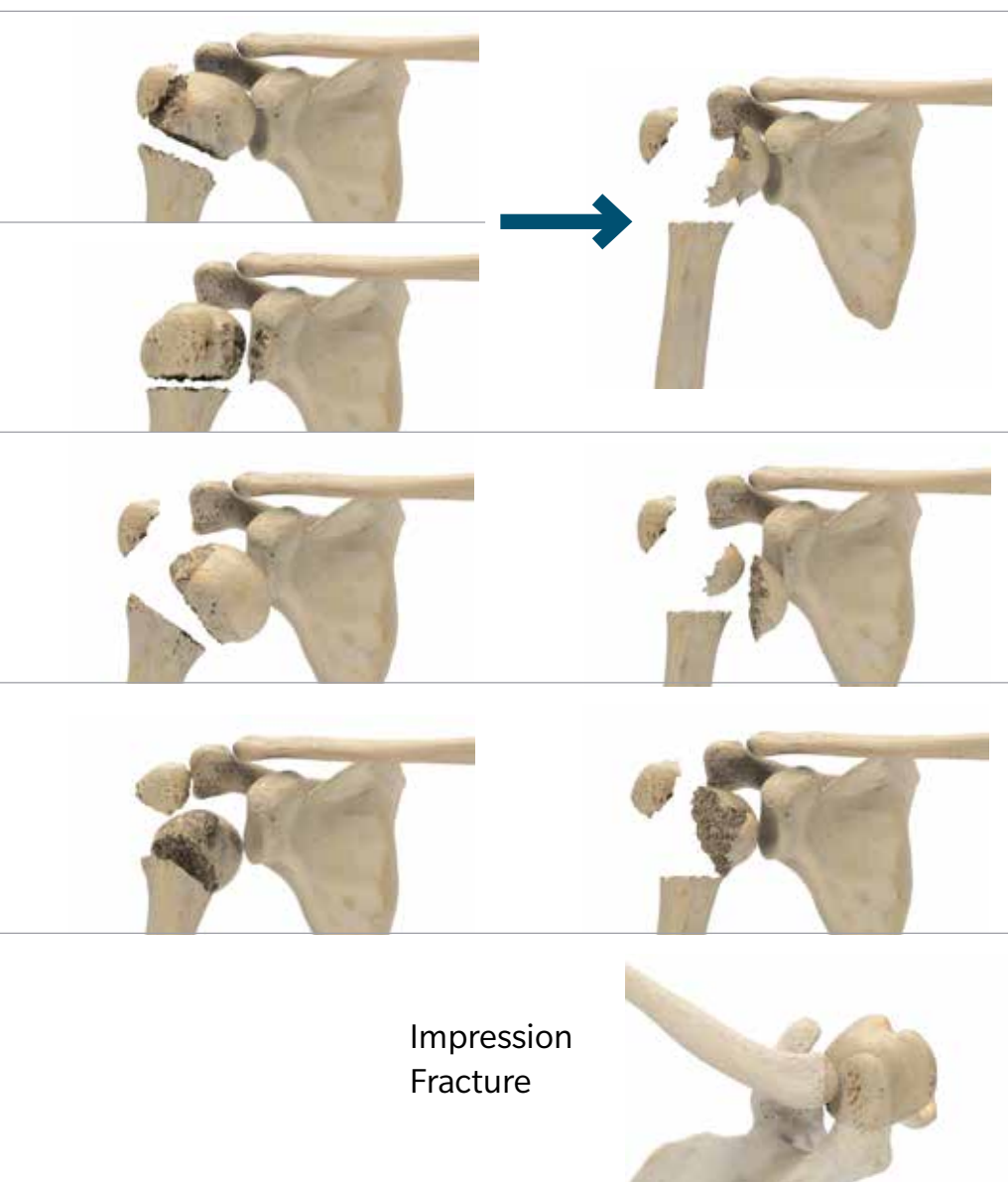
Head Splitting Fracture



Neer's classification of proximal humerus fractures, source: Neer CS 2nd. Displaced proximal humeral fractures. I. Classification and evaluation. J Bone Joint Surg Am. 1970;52:1077-1089.

3 Part

4 Part



FLOWCHART OF MANAGEMENT



Young
(<50yrs)



Middle Age
(50-70yrs)



Elderly
(>70yrs)



Nonoperative

1 Part

Nonoperative

1 Part

Nonoperative

1 Part
2 Part (Some)
3 Part (Some)
4 Part (Some)

Operative (ORIF)

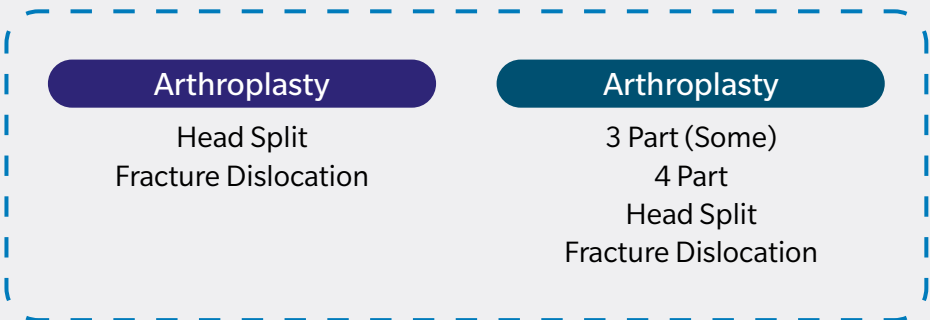
2 Part
3 Part
4 Part
Head Split
Fracture Dislocation

Osteosynthesis (ORIF)

2 Part
3 Part
4 Part

Osteosynthesis (ORIF)

2 Part
3 Part



Arthroplasty

Head Split
Fracture Dislocation

Arthroplasty

3 Part (Some)
4 Part
Head Split
Fracture Dislocation

Intramedullary Nailing

2 Part
3 Part
4 Part

Intramedullary Nailing

2 Part
3 Part
4 Part

Intramedullary Nailing

2 Part
3 Part

PROXIMAL HUMERAL FRACTURES

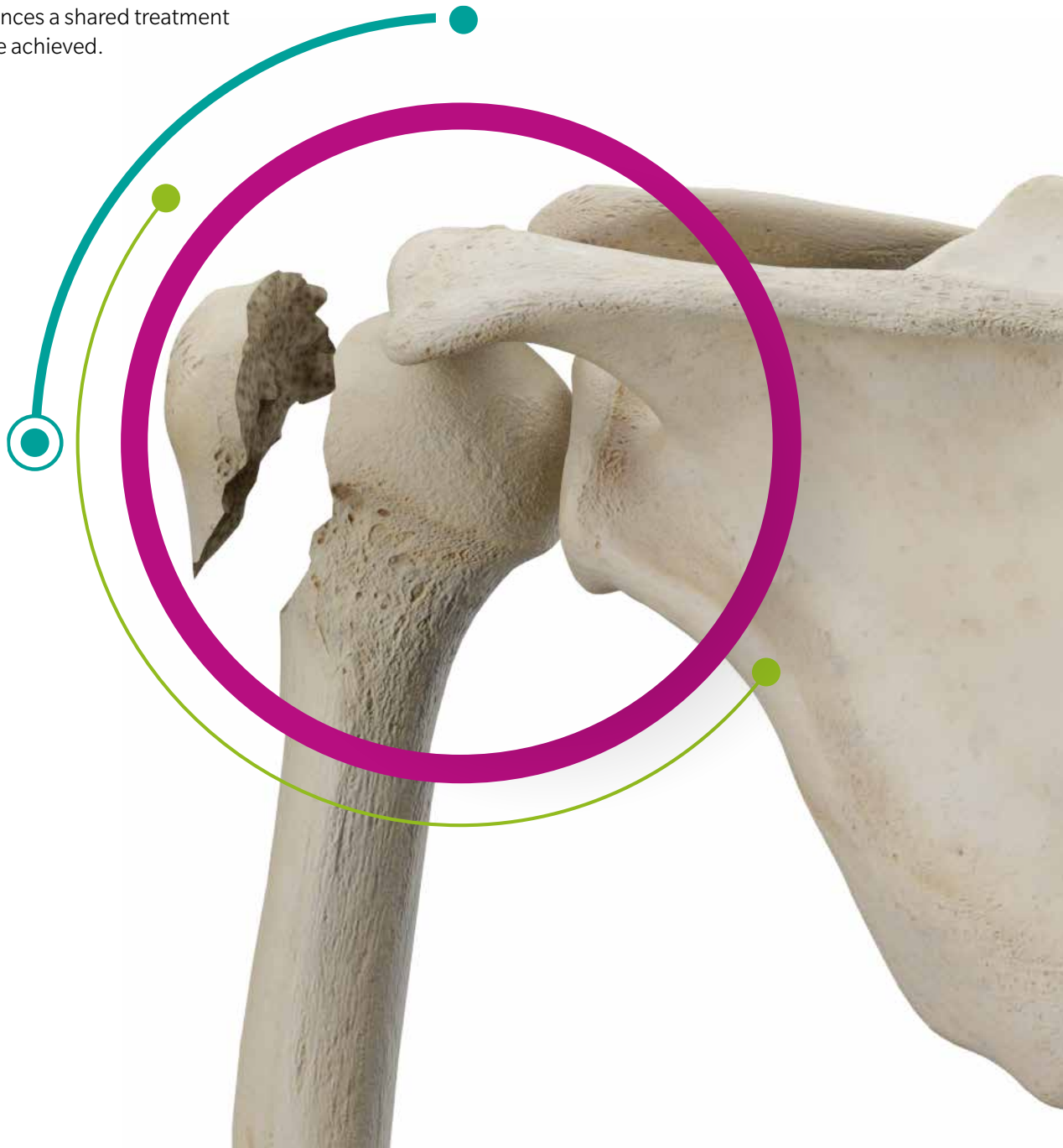
Proximal humeral fractures account for 4% to 5%¹ of all fractures, particularly affecting osteoporotic elderly patients after low-energy trauma. They are the third most common fracture type in individuals over 65 years of age. These fractures can lead to significant pain and functional loss.

Proximal humeral fractures have been increasing in incidence as life expectancy has increased in recent decades.

Multiple treatment options exist for proximal humeral fractures, including nonoperative treatment, closed reduction and percutaneous pinning (CRPP), IMN, open reduction and internal fixation (ORIF), transosseous suture fixation, hemiarthroplasty and primary reverse total shoulder arthroplasty (TSA).

Based on age, comorbidity, functional demand, fracture pattern, bone and soft tissue quality and patient preferences a shared treatment decision can be achieved.

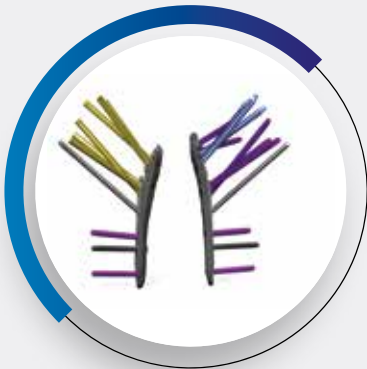
Optimal treatment of proximal humeral fractures requires clinical judgment based on fracture characteristics, bone quality, patient factors, and surgeon experience with the array of available techniques.



PRODUCT OFFERING FOR FRACTURE MANAGEMENT



2 Part



ALPS PHP



MAXBRAID AND
BROADBAND TAPE



AFFIXUS
HUMERAL NAIL



3 Part

4 Part



COMPREHENSIVE
FRACTURE HEMI



COMPREHENSIVE
REVERSE

4 Part

DISLOCATION



TRAUMA

Products



A.L.P.S.[®] PROXIMAL HUMERUS

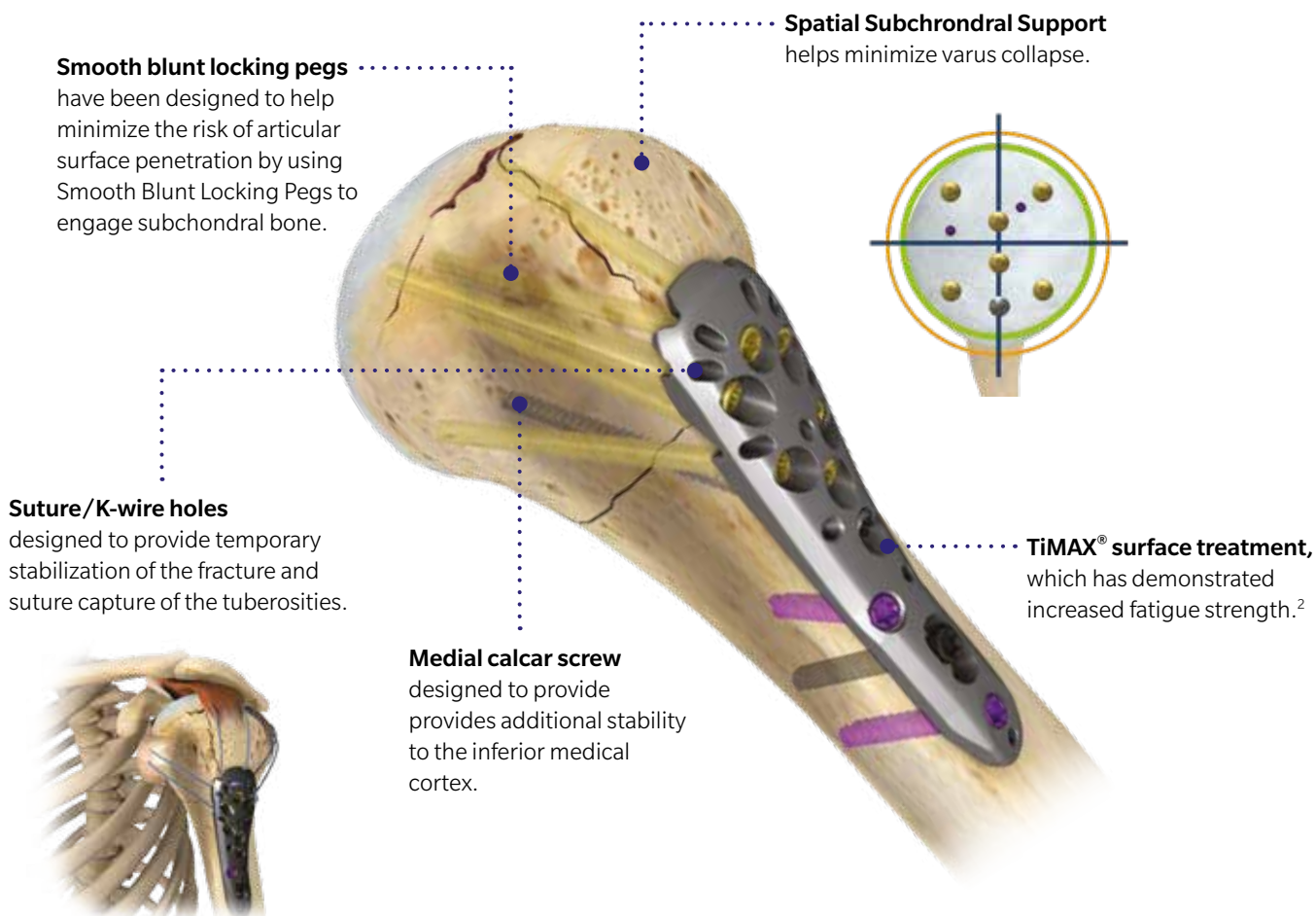
The A.L.P.S. Proximal Humerus Plating System is designed to help minimize the risk of some of the complications commonly associated with treating proximal humerus fractures, including:

- **Minimizing varus collapse** by creating an internal subchondral support system of diverging and converging locking screws.
- **Minimizing articular surface** screw penetration through the use of smooth blunt-end pegs.
- **Minimizing subacromial impingement** by using a low plate configuration that sits 2 cm distal to the greater tuberosity.



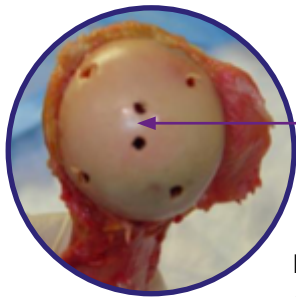
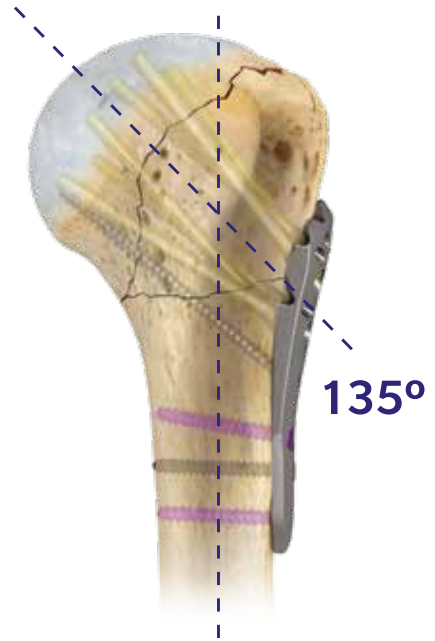
Features and Benefits

- Spatial Subchondral Support.
- Options – high and low plate.
- A.L.P.S.[®] Technology.

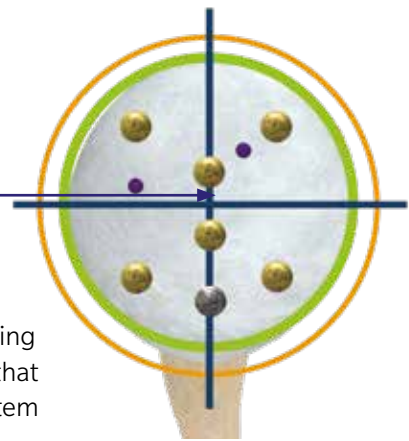


What is Spatial Subchondral Support?

- Subchondral support system of converging and diverging screws is designed around 135° anatomic neck-shaft angle (central k-wire).
- Designed to create an internal support system utilizing predetermined converging and diverging peg trajectories.
- Symmetrical distribution in all 4 quadrants of the articular surface.

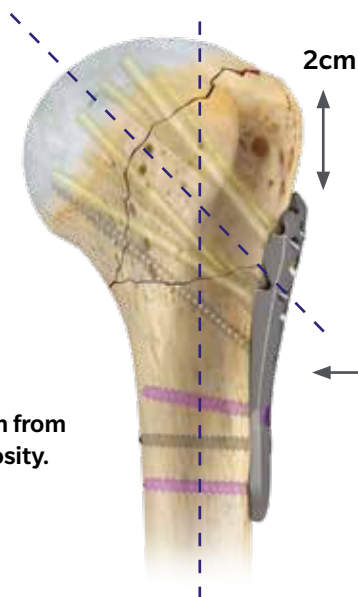


Central k-wire position at 135° "Center-center"



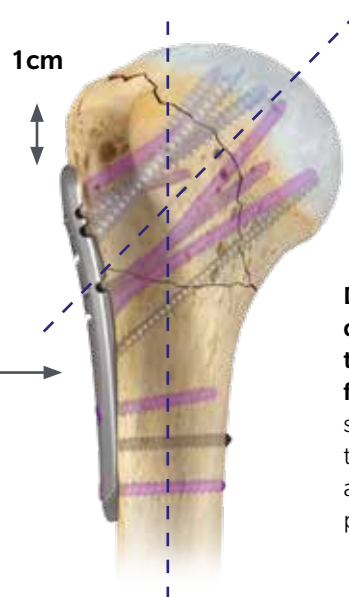
Designed to minimize varus collapse, using converging and diverging peg trajectories that create an internal subchondral support system through range of motion.

LOW PLATE



Low Plate sits 2 cm from the greater tuberosity.

HIGH PLATE



Designed to achieve direct screw fixation of the greater tuberosity fragment, the High Plate sits 1 cm from the greater tuberosity and offers 2 additional screw holes proximally.

A.L.P.S.[®] Technology

The A.L.P.S. Proximal Humerus Plating System features A.L.P.S. Technology.

Features and Benefits

- Pre-loaded, disposable F.A.S.T. Guide Inserts help the surgeon to drill accurately, and reduce intraoperative assembly to save OR time.
- Tapered triple-lead locking screws and dual threaded pegs facilitate easy removal.
- Cobalt chrome multi-directional locking screws allow for up to a 25° cone of angulation.
- Anatomic plates that can be contoured in-situ to help optimal fit (11 and 14-hole plates only).



Screw Options

Designed to achieve optimal fixation with tapered, triple lead locking and low profile non-locking screw options.

25° cone of angulation using cobalt chrome multi-directional locking screws (MDS) that lock into the plate by creating their own threads.

One Driver Simplicity T15 driver used for all screws and pegs.

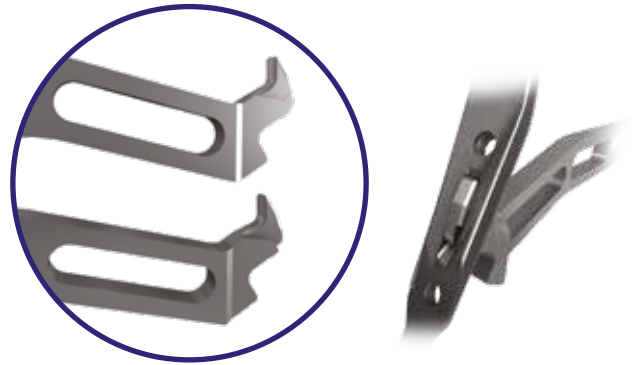


Facilitate accurate drilling and easy plate identification with pre-loaded F.A.S.T. Guide inserts
 –Lime = Left, Rose = Right (shaft holes).

Gold F.A.S.T. Guide Inserts indicate the proximal holes that can utilize locking peg fixation.

Plate Contouring

Customized contouring utilizing in-situ multi-planar bending of the shaft (11 and 14-hole plates).

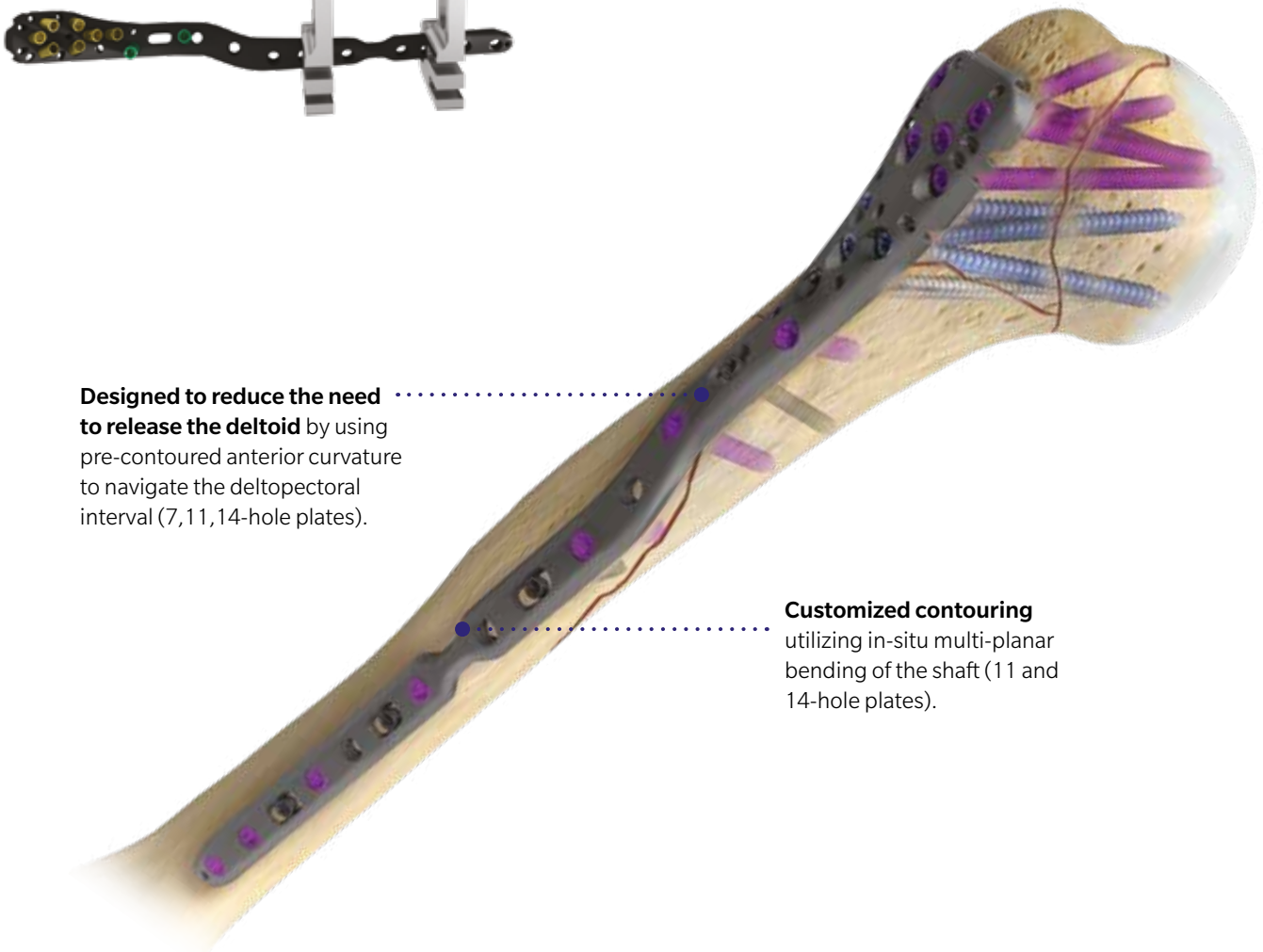


Axial/Sagittal Bends:



Designed to reduce the need to release the deltoid by using pre-contoured anterior curvature to navigate the deltopectoral interval (7, 11, 14-hole plates).

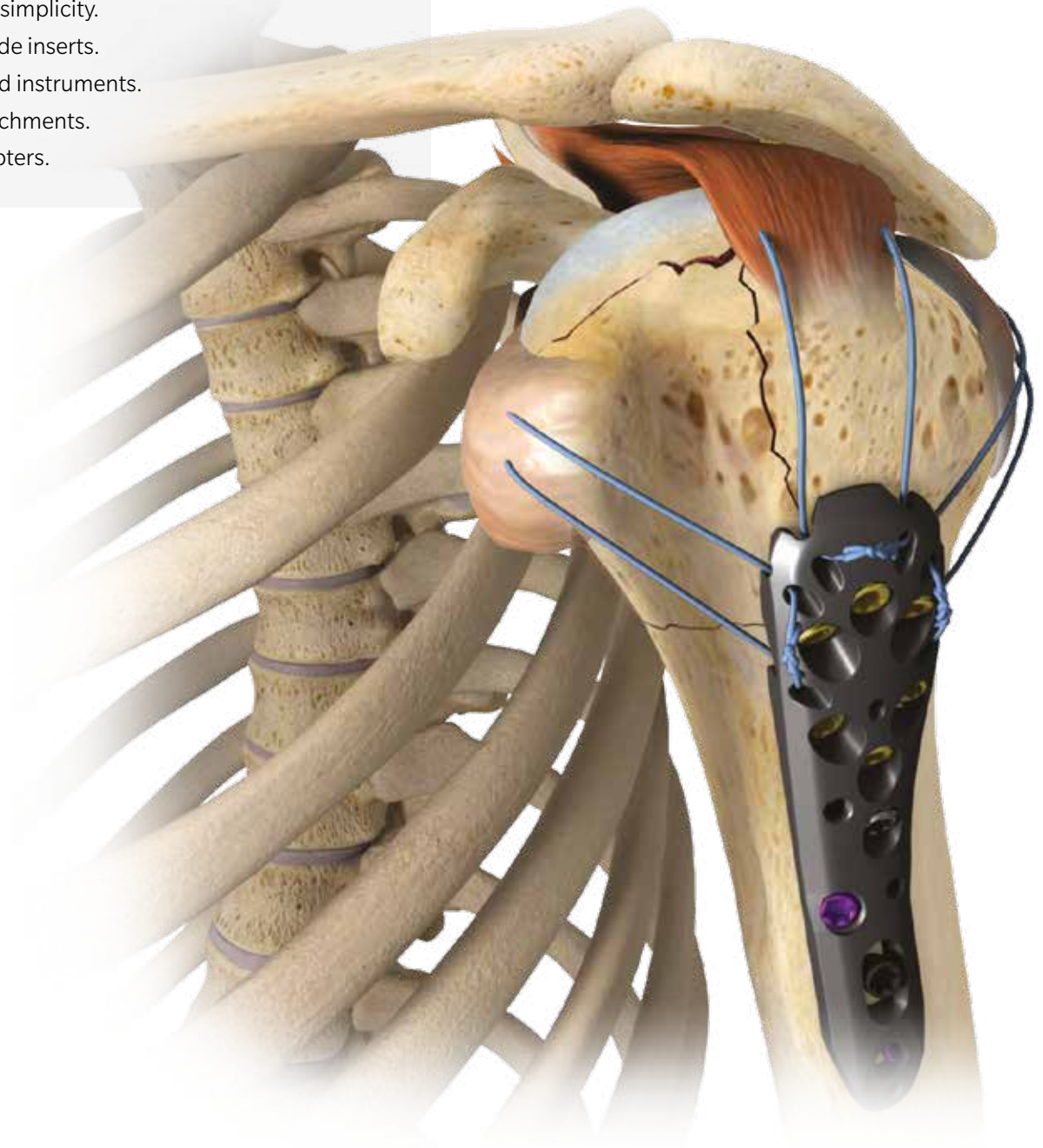
Customized contouring utilizing in-situ multi-planar bending of the shaft (11 and 14-hole plates).



The A.L.P.S. Proximal Humerus Plating System is designed to provide intraoperative flexibility and efficiency to the surgical team.

Features and Benefits

- Plate positioning.
- Central k-wire.
- Medial Calcar.
- One driver simplicity.
- F.A.S.T. Guide inserts.
- Color coded instruments.
- Suture attachments.
- K-wire adapters.



TRAUMA

Products



AFFIXUS NATURAL PROXIMAL HUMERAL NAIL SYSTEM

A bone nailing system that combines the best features of Natural Nail and the AFFIXUS Natural Nail Humeral System is a long bone nailing system built on the Natural Nail and AFFIXUS intramedullary platforms.

This system offers a complete portfolio of implants and instruments, that allows to treat a wide range of humeral fractures using simple and efficient instrumentation.

Features and Benefits

- CoreLock Technology.
- Metaphyseal screw options.
- Variable angled ascending screw.
- Universal A/R implant option.
- Blunt tip screw options.



Corelock Technology

The AFFIXUS Natural Nail Proximal Humeral Implant integrates the CoreLock Fixed-Angle Interlocking Mechanism, allowing the user to lock all metaphyseal screws in the construct at a fixed angle at once designed to give superior fracture support.



Methaphyseal screw options

The nail implants specifically, were designed with multiple screw options positioned in multi-planar axis, including; AP, ML oblique and ascending/descending angles, which helps the surgeons to us a minimally invasive approach in even the most complex humeral fractures.

The system also includes optional blunt tip screws and washers for more precise applications, if desired.



SCREWS

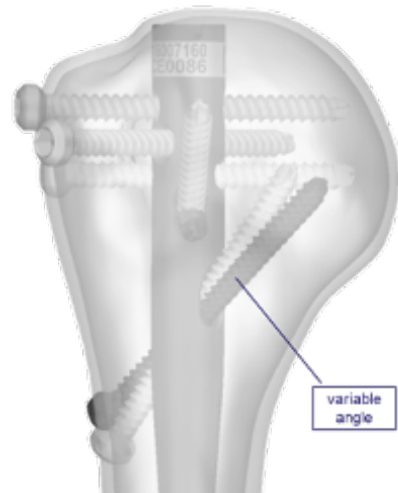
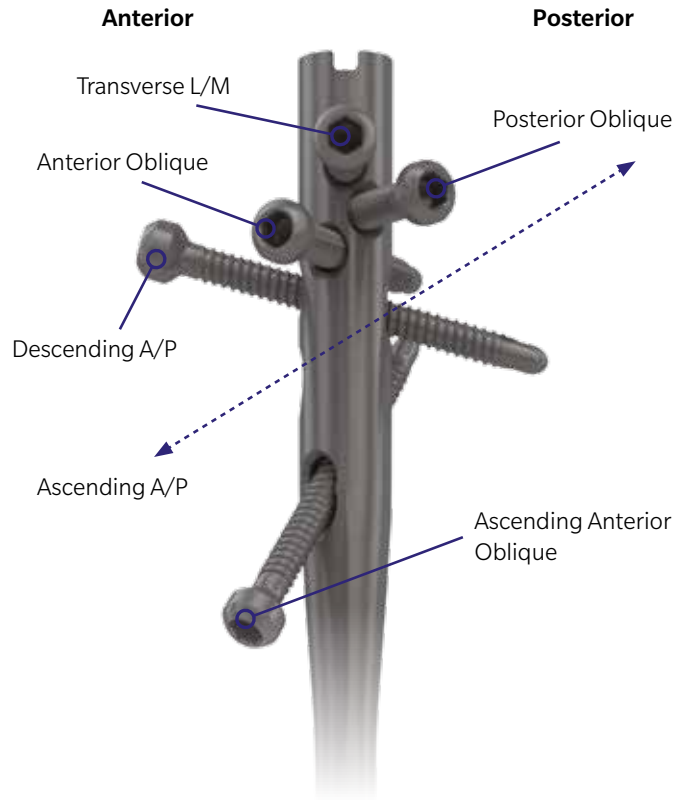
4.0 mm Blunt Tip



4.0 mm Cortical



WASHERS

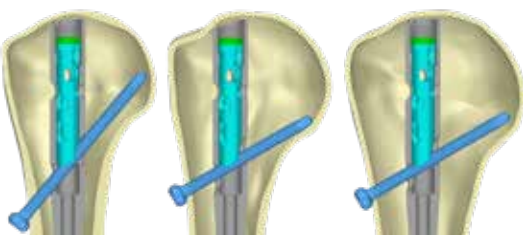


Dual Angled Medial Calcar

Angled ascending screw to target the medial calcar on various size of patients.

Acute positioning and support along the critical medial calcar.

Ascending Screw Angle 30° + 50° on different Humeral Bone Sizes.



Universal A/R implant option

The AFFIXUS Natural Proximal Nail System is available for antegrade and retrograde surgical approaches and provides multiple options for acute fixation of challenging fracture patterns.

Angled ascending screws are designed to target the medial calcar independent from the size of the patient and provide an option for acute positioning and support along the critical medial calcar.

The targeting guides offer reduction and screw positioning assistance, with specific pin cannulas and locations for fragment targeting and rotational stability.

Simplistic and Efficient Instrumentation

The metal instrument case is designed for a simple step-by-step approach to allow efficient handling and reproducible outcomes.

The standardized instrumentation maintains harmony across the platform and provides intraoperative options including entry portals, reduction tools and color-coded screw placement.



EXTREMITIES

Products



HEMI ARTHROPLASTY

Comprehensive Fracture Hemi

The Comprehensive Fracture System is designed for complex fractures of the proximal humerus. It is also cleared for use in non-fracture cases and can be cemented or a press-fit. The system is compatible with the humeral heads and glenoids of the Comprehensive Shoulder Systems.

Anatomic Fracture Stem

The Anatomical Shoulder Fracture System treats complex 3- and 4-part fractures of the proximal humerus. With the unique features and anatomical design of this stem, a complex case is now simplified with this specially designed implant for tough fracture cases.

The aggressive fracture spikes are designed for stable anchoring of the tuberosities to the stem — increasing primary stability. Additionally, the system offers a left and right proximal configuration of the humeral head that optimizes suture hole orientation in order to aid in the repositioning of the tuberosities below the head, restoring the original anatomy.

The Anatomical Shoulder Fracture Stem is also convertible to an inverse/reverse in cases of severe rotator cuff tears. This may simplify revision surgery, since the need to remove a well-fixed stem is eliminated.



REVERSE

Comprehensive Reverse

The Comprehensive Reverse Shoulder System was born from a desire to provide a complete shoulder arthroplasty solution to surgeons, without compromise.

Now, this spirit of innovation lives on through evolved solutions for challenging cases, including Comprehensive Vault Reconstruction System (VRS), Segmental Revision System (SRS) for reverse and anatomic, Augmented Baseplates and Mini Humeral Trays and Bearings.*

Confidently approach clinical challenges with proven technologies, versatile innovation and market-leading simple solutions in the Comprehensive Reverse Shoulder System.



TM Reverse

Zimmer Biomet's Trabecular Metal™ Reverse Shoulder System presents a complete solution designed to meet the demands put on reverse shoulder systems. These objectives include: returning cuff-deficient patients to simple activities of daily living, optimizing range of motion in the face of glenoid erosion, and ensuring tuberosity repair in complex fractures.

Our Trabecular Metal base plate is designed to provide superior glenoid stability while the humeral components have been designed to reduce the likelihood of scapular notching.



TMR with Comprehensive Glenoid shown – please note this is only compatible with a 36mm Glenosphere.

*Not available in all markets.

UPPER EXTREMITIES

Products



COMPREHENSIVE FRACTURE STEM

High Versatility

- Anatomic 45° comprehensive platform family stem for many applications.
- Designed to allow more room under the collar for tuberosity reconstruction.
- 17 head sizes.
 - Diameters range from 38 to 58mm.
 - Head heights range from 18 to 27mm.
 - Cobalt Chrome (Ti option for nickel sensitive patients).
 - Variable Offset (infinite offset options between 0.5-4.5mm).
 - Ability to mix and match heads and glenoids.

Proximal Hashmarks

- Used throughout procedure to help replicate proper head height replacement.
- Precise hashmarks in 2.5mm increments for increase accuracy.

Medial Suture Slot

- Helps with tuberosity reconstruction.



Positing Sleeve

- Material: PMMA (polymethylmethacrylate).
- Maintains stem height without use of an external jig.
- Height adjustments can be made and modified intraoperatively.
- Not used when press-fitting stem.

Stem

- 6 diameters 4-14mm (2mm increments).
 - Tip to tip length 140mm.
 - PPS coating proximal to enhance biological fixation.
- Designed for cemented and uncemented applications.

Anterolateral, Posterolateral Suture Fins

- Protects against rotation.
- Provide multiple options for tuberosity reconstruction.
- Anterolateral fin lines up with lateral edge of bicipital groove.
- Engineered contour around suture holes shown in testing to significantly decrease suture wear.

Proven. Versatile. Simple.

Zimmer Biomet understands the demands put on reverse shoulder systems. We've engineered innovation into each component of our reverse shoulder systems.

The task of repairing complex fractures, or restoring as much range of motion as possible so patients with rotator cuff deficiencies can return to daily activities can be challenging.

COMPREHENSIVE REVERSE

The Comprehensive Reverse Shoulder has been trusted since 2008.

It has a proven clinical history³⁻¹⁴, and combines materials that have been tested to withstand the demands of joint arthroplasty. Common clinical challenges such as scapular notching, a more demanding patient population and polyethylene wear were inputs of the original design rationale, and Comprehensive Reverse has been designed to provide the answers.

Stem options to satisfy the needs of surgeons for any scenario: primary and revision, anatomic and reverse, conversion of anatomic to reverse and fracture.

Segmental Revision System (SRS) for advanced humeral bone loss for either anatomic or reverse scenarios.

Humeral Stems

- For use with or without bone cement, and made from Titanium with proximal PPS Porous Plasma Spray designed for enhanced biologic fixation. Convertible from anatomic (total) shoulder to the Comprehensive Reverse Humeral Tray and Bearing.
- 45°/135° anatomic neck-shaft angle, available in 4 different lengths: Micro, Mini, Standard and Revision. Each length is available in 1 mm increment diameters from 4–20 mm.
- SRS (Segmental Revision System) for advanced humeral bone loss for either anatomic or reverse situations.

Features and Benefits

- Porous Plasma Spray (PPS) coating .75mm thick 1.5mm press-fit.
- Expansive stem portfolio intended to satisfy the needs for any scenario.
- Titanium with the exception of the fracture stem, which is Cobalt Chrome.
- Reverse morse taper to facilitate unobstructed preparation of the glenoid.
- Un-cemented or cemented humeral stems.
- Screw fixed glenoid baseplate.
- Polished distally.



SIGNATURE™ ONE

Surgical Planner



SIGNATURE™ ONE SURGICAL PLANNING SOFTWARE AND GUIDES

Zimmer Biomet's Signature™ ONE Surgical Planning System provides a 3-D image-based approach to preoperative visualization, surgical planning and patient specific guide creation.

Based on each patient's unique anatomy, integrated with proprietary algorithms and known anatomical landmarks, Signature ONE offers a tailored approach to shoulder arthroplasty.

Signature ONE Planning and Guides have been designed to help the surgeon to achieve:

CONFIDENCE

in understanding patient anatomy with high-quality 3D reconstruction and the ability to reproduce that plan to the patient.

SIMPLICITY

with easy to use guides and software interface.

CONVENIENCE

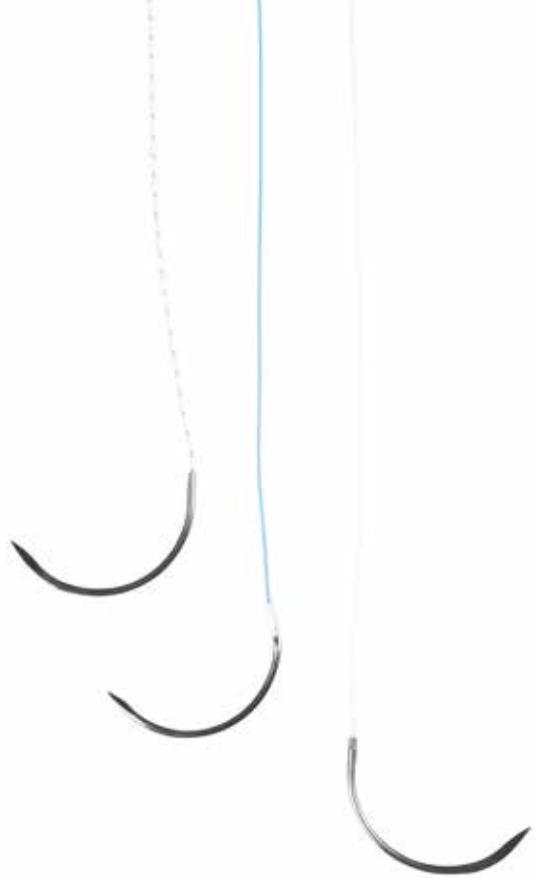
through on-line access with any computer or iPad® along with a surgical technique that fits intuitively within existing techniques.



SPORTS MED

Products





MAXBRAID™ SUTURES

MaxBraid Sutures have great strength, versatility and design for orthopaedic soft tissue repairs.

The coreless sutures are created with a proprietary braid to lie flat when tied and have a smaller knot footprint. The suture ranges from sizes 4-0 to #5 with various needle attachments in packs and boxed configurations.

Features and Benefits

CORELESS DESIGN

- Proprietary braid allows suture to lie flat when tied compared to cored sutures.
- Coreless UHMWPE weave of MaxBraid and TRU-Link Sutures is designed for low-profile knot stacks without mitigating strength.

VERSATILITY

- Suture portfolio ranges from 4-0 through #5 suture sizes with a diverse selection of colors and needle options to aid in suture management both arthroscopically and in open procedures.

HIGH STRENGTH

- Over 10 years of proven high strength testing.¹⁵⁻¹⁷
- -#2 suture knot pull tensile strength is 14.6lbf.¹⁵⁻¹⁷
- -#5 suture knot pull tensile strength is 27.2lbf.¹⁵⁻¹⁷

BROADBAND TAPE

Ideal for a variety of applications, BroadBand Tape may be used anywhere from a simple stitch in the labrum to a mattress stitch in the rotator cuff.

Zimmer Biomet's BroadBand Tape is available in a variety of colors with solid and co-braid patterns. Introducing to the market, black and double zig-zag blue/black co-braid, these distinct colors are designed to provide optimal visibility for suture management and repair.

Features and Benefits

BROADER FOOTPRINT OVER TISSUE

- BroadBand Tape is designed to provide greater load distribution than standard suture to address suture/tissue tear through.

SMOOTH, SILK-LIKE FEEL

- Non-abrasive, easy to handle and gentle on tissue and gloves.

TIE-ABILITY AND LOW KNOT PROFILE

- Coreless, single weave braid allows for low profile knots to be tied, while maintaining knot strength of standard suture.

SEAMLESS LOADING INTO INSTRUMENTATION

- Flat BroadBand Tape transitions into round suture ends.



References:

1. Passaretti et al., Epidemiology of Proximal Humeral Fractures Managed in a Trauma Center, *Journal of Shoulder and Elbow Surgery*, 2017
2. Compared to 316L electropolished stainless steel, color anodized titanium and machined titanium. Laboratory results are not necessarily indicative of clinical performance.
3. Vivacit-E Vitamin E Highly Crosslinked Polyethylene Long-Term Performance for High Demand Patients. Zimmer Technical Memo, 2014. Literature # 97-7255-181-00 Rev 1. (Laboratory studies are not necessarily indicative of clinical performance.)
4. Peiserich M, et al. Retention of Mechanical Properties in a Blended Vitamin E Polyethylene After Extreme Oxidative Challenge. Poster 1060, ORS 2013 Meeting. 2013. (Laboratory studies are not necessarily indicative of clinical performance.)
5. Mimnaugh, K. et al. 100 Million-Cycle Wear Evaluation of Crosslinked Vitamin E Grafted Polyethylene (VE-HXPE) Acetabular Liners. ORS 2016 Annual Meeting Paper No. 0403. (Laboratory studies are not necessarily indicative of clinical performance.)
6. Zimmer Prolong Highly Crosslinked Polyethylene Brochure. Literature #: 97-5952-101-00 Rev 2. (Laboratory studies are not necessarily indicative of clinical performance.)
7. Xinning L, Dines J, Warren R, Craig E, Dines D. Inferior Glenosphere Placement Reduces Scapular Notching in Reverse Total Shoulder Arthroplasty. *Orthopedics*. 2015; 38(2):e88-e93.
8. Jost, Patrick W, Dines, Joshua S, Griffith, Matthew H, Angel, Michael, Altcheck, David W, Dines, David M. Total Shoulder Arthroplasty Utilizing Mini-Stem Humeral Components: Technique and Short-Term Results. *HSSJ* (2011) 7:213-217.
9. Wagner, Eric R, Statz, Joseph M, Houdek, Mathew T, Cofield, Robert H, Sanchez-Sotelo, Joaquin, Sperling, John W. Use of a shorter humeral stem in revision reverse shoulder arthroplasty. *J Shoulder and Elbow Surg*. 2017.
10. S.A. Guiseffi, P Streubel, J. Sperling, J. Sanchez-Sotelo. Short-stem uncemented primary reverse shoulder arthroplasty. *The Bone & Joint Journal*. 2014; 96-B: 526-9.
11. Comprehensive Reverse Shoulder Post-Market Clinical Study (Protocol EX007). September 2018 Annual Report.
12. Werner B, Dines J, Dines D. Platform systems in shoulder arthroplasty. *Curr Rev Musculoskeletal Med*. 2016.
13. Williams P, Trehan S, Tsouris N, Dines J, Dines D, Edward C, Gulotta L, Warren R. Functional Outcomes of Modular Conversion of Hemiarthroplasty or Total to Reverse Total Shoulder Arthroplasty. *HSS Journal*. 2017.
14. Wiser K, Borbas P, Ek E, Meyer D, Gerber C. Conversion of Stemmed Hemi-or Total to Reverse Total Shoulder Arthroplasty: Advantages of a Modular Stem Design. *Clin Orthop Relat Res*; 2015; 473:651-660.
15. Cayenne Medical, Document #: 71395 Rev. H, 2021.
16. Cayenne Medical, Document #: 71396 Rev. G, 2021.
17. Cayenne Medical, Document #: 71397 Rev. H, 2021.

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