



Reaching Higher by Design



AltiVate[™] Anatomic



AltiVate Reverse®



Discovery[®] Elbow

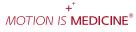


AltiVate[™] Match Point System[®]



Alians Proximal Humerus





Reaching higher by design...

SO PATIENTS CAN, TOO.

At DJO Surgical, our end goal is to help patients reach their greatest altitudes. We strive to achieve this through innovation, proven results, and clinical heritage. Our approach is to partner with surgeon experts in the field to design systems that ultimately provide extremity solutions. DJO Surgical Extremity Solutions are anatomic designs engineered to provide optimized function, enhanced fixation, and flexibility and versatility to manage differing patient needs. Our aim is to reach new elevations by providing clinicians solutions to help their patients reach higher.



AltiVate[™] Reverse[®] Shoulder

The anatomically-based, data-driven AltiVate Reverse system incorporates enhanced fixation technologies and precision instrumentation for superior fit in more of your patients.

Anatomic Design with Optimized Function

Elevating the 10-year clinical success of the RSP®, the first reverse shoulder design to successfully incorporate a center of rotation (COR) lateral to the glenoid, DJO Surgical introduces its latest Extremity Solution. The AltiVate Reverse system incorporates an optimized stem design based on anatomic studies with CT scans for determination of shell-to-stem position as well as the ability to best match patient anatomy for anatomic total and reverse total shoulder constructs. An anatomic 135° humeral neck-shaft angle has shown through biomechanical testing to help reduce the potential for inferior scapular notching.¹ The system remains based on a lateralized center of rotation, and the premier offering is a glenosphere with the center of rotation closest to the anatomic center.



Enhanced Fixation Design and Technologies

On both the glenoid and humeral side, expect improved short and long term fixation as a result of stable initial fixation as well as ideal conditions for bony ingrowth.



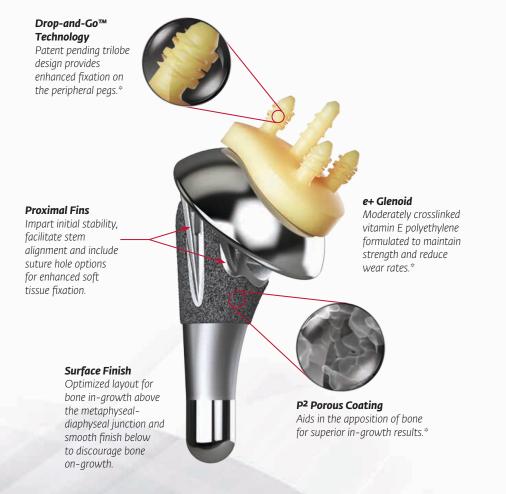
Flexibility and Versatility

Implants

AltiVate[™] Anatomic Shoulder

Reaching Higher by Design

The data-driven design of the AltiVate[™] Anatomic Shoulder System features a short P² coated humeral stem providing superior ingrowth and a glenoid component with patent pending Drop-and-Go[™] technology for immediate fixation. The result is a truly anatomic reconstruction with fixation you can feel.



Instrumentation

The AltiVate[™] Anatomic instrumentation is designed to facilitate accurate implant placement and increase visibility of the surgical site.



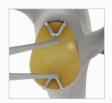


alignment during drilling and reaming of the glenoid

The lateral fins and distal extension of the humeral broach assist stem implant alignment







Innovative low profile designs and translucent materials increase function and visibility

Data-Driven Design

A comprehensive 3 dimensional CT database of humeral and glenoid specimens was used to optimize implant design resulting in a truly anatomic reconstruction.



Putting It All Together

DJO shoulder systems are designed to provide a complete and seamless shoulder solutions platform. Conversion Modules minimize the potential challenges of removing a well-fixed humeral stem by allowing conversion of a primary total shoulder to a reverse shoulder and a reverse shoulder to a hemi-arthroplasty prosthesis.



AltiVate[™] Match Point System[®]

Enabling surgeons to preoperatively and intraoperatively tailor shoulder arthroplasty to the patient's unique anatomy, AltiVate Match Point System, in conjunction with the AltiVate Reverse or Turon Anatomic shoulder implant system, allows surgeons to *Aim* at enhancing patient outcomes and *Set* patients' goals to Reach Higher by ensuring the surgical plan is *Matched* to the patient's specific anatomy.

Aim

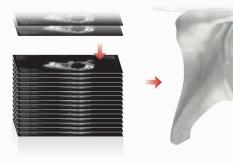
- at enhancing patient outcomes
- CT based 3D model
- Visualize unique anatomy
- Prepares surgeons preoperatively

Set

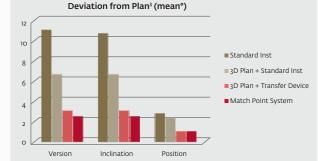
- patient goals to reach higher
 - Virtually planned surgery
 - Optimized implant position
- Based on entirety of anatomy not visible in surgery

Matched

- to the patient's specific anatomy
 - Guide and model delivered to surgery
 - Accurately reproduces plan intra operatively
 - Reduces variability of conventional methods







Drill Cylinder - designed to replicate the planned trajectory determined by the surgeon through the preoperative planning process

Patient Identifier – unique identification code specific for each patient case links the guide to the patient

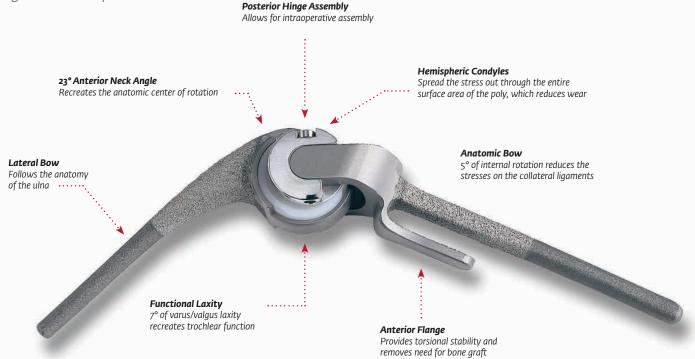
Push Handle - gentle pressure applied to the push handle further stabilizes the guide while drilling the pilot hole

Coracoid Clip - unique coracoid clip securely attaches to the patient's coracoid, providing a stable and reproducible fit of the guide to the patient's anatomy

AltiVate[™] Discovery[®] Elbow System

Anatomic Design

The Discovery Elbow System is designed to reproduce the anatomy and restore the mechanics of the elbow. With its user-friendly instrumentation and intra-operative assembly options, this implant is suitable for surgeons of all experience levels.



Flexibility and Versatility

Any size ulnar component can be paired with any size humeral component. The size 3 humeral component, however, can only be paired with the size 2.5 ulnar component.

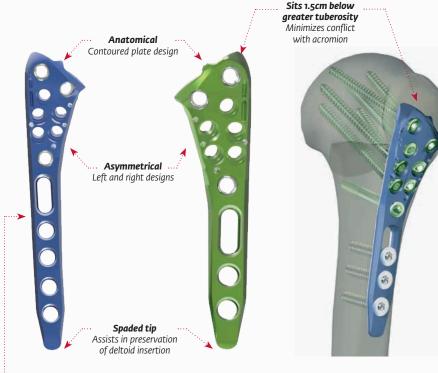




Alians Proximal Humerus

The Alians Proximal Humerus provides another fracture management option to the AltiVate[™] Extremity Solutions Portfolio. This fracture plate system features an anatomically contoured design with patented polyaxial locking screw options and is paired with simple, streamlined instrumentation.

Anatomic Design



Straight edge lines up with bicipital groove Easy plate positioning

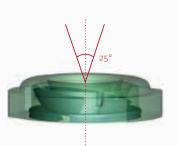


Optimized proximal screw hole placement

Divergent fixed angled screws placed in inferior half of humeral head

- Targets location of most robust bone
- Blunt-tipped screws limit protrusion through articular surface

Flexibility and Versatility



Patented Dualtec System I[®] polyaxial locking fixation

- Variable angle technology for 25° (±12.5°)
- Allows for repeated insertion and re-angulations of screw without sacrificing its strength



Five unique suture holes for soft tissue fixation

 Accessible even after plate attachment, so pre-loading sutures is not required



Simple and streamlined instrumentation

• 1 tray, 1 screw size, 1 drill bit, 1 driver

Manufactured by



ALIANS AND DUALTEC SYSTEM I ARE TRADEMARKS OF NEWCLIP USA.

Proven Results

The Turon shoulder is benchmarked off of the design and principles of the Charles Neer shoulder prosthesis; and RSP is one of the most, well-published reverse shoulders on the market with over fifty peer reviewed journal publications.

Stephens BC, Simon P, Clark RE, Christmas KN, Stone GP, Lorenzetti AJ, Frankle MA. Revision for a failed reverse: a 12-year review of a lateralized implant. J Shoulder Elbow Surg 2016. 25:e115-e124.

Levy JC, Ashukem MT, Formaini NT. Factors predicting postoperative range of motion for anatomic total shoulder arthroplasty. J Shoulder Elbow Surg 2016;25:55-60.

Levy JC. Observation of initial postoperative radiolucent lines using a modern pegged glenoid design. Int J Shoulder Surg 2016;10(2) 67-71.

Formaini NT, Everding NG, Levy JC, Rosas S. Tuberosity healing after reverse shoulder arthroplasty for acute proximal humerus fractures: the "black and tan" technique. J Shoulder Elbow Surg. 2015; 1-8.

Formaini NT, Everding NG, Levy JC, Santoni BG, Nayak AN, Wilson C, Cabezas AF. The effect of glenoid bone loss on reverse shoulder arthroplasty baseplate fixation. J Shoulder Elbow Surg. 2015.

Triplet JJ, Everding NG, Levy JC, Moor MA. Functional internal rotation after shoulder arthroplasty: a comparison of anatomic and reverse shoulder arthroplasty. J Shoulder Elbow Surg. 2015; 24:867-874.

Cusick MC, Hussey MM, Steen BM, Hartzler RU, Clark RE, Cuff DJ, Cabezas AF, Santoni BG, Frankle MA. Glenosphere dissociation after reverse shoulder arthroplasty. J Shoulder Elbow Surg. 2015 July; 24(7): 1061-1068.

Hussey MM, Steen BM, Cusick MC, Cox JL, Marberry ST, Simon P, Cottrell BJ, Santoni BG, Frankle MA. The effects of glenoid wear patterns on patients with osteoarthritis in total shoulder arthroplasty: an assessment of outcomes and value. J Shoulder Elbow Surg. 2015 May; 24(5):682-690.

Teusink MJ, Pappou IP, Schwartz DG, Cottrell BJ, Frankle MA. Results of closed management of acute dislocation after reverse shoulder arthroplasty. J Shoulder Elbow Surg. 2015 Apr; 24(4):621-627.

Simon P, Gupta A, Pappou I, Hussey MM, Santoni BG, Inoue N, Frankle, MA. Glenoid subchondral bone density distribution in male total shoulder arthroplasty subjects with eccentric and concentric wear. J Shoulder Elbow Surg. 2015 Mar; 24(3):416-424.

Steen BM, Cabezas AS, Santoni BG, Hussey MM, Cusick MC, Kumer AG, Frankle MA. Outcome and value of reverse shoulder arthroplasty for treatment of glenohumeral osteoarthritis: a matched cohort. J Shoulder Elbow Surg. 2015 Mar.

Levy JC, Everding NG, Frankle MA, Keppler LJ. Accuracy of patientspecific guided glenoid baseplate positioning for reverse shoulder arthroplasty. J Shoulder Elbow Surg. 2014; 23:1563-1567.

Schwarts DG, Cottrell BJ, Teusink MJ, Clark RE, Downes KL, Tammembaum RS, Frankle MA. Factors that predict postoperative motion in patients treated with reverse shoulder arthroplasty. J Shoulder Elbow Surg. 2014 23:1289-1295.

Levy JC, Everding NG, Gil CC Jr, Stephens S, Giveans R. Speed of recovery after shoulder arthroplasty: a comparison of reverse and anatomic total shoulder arthroplasty. J Shoulder Elbow Surg. 2014; 23:1872–1881.

Teusink M, Otto R, Cottrell B, Frankle, MA. What is the effect of postoperative scapular fracture on outcomes of reverse shoulder arthroplasty? J Shoulder Elbow Surg. 2014, June; 23(6):782-790.

Cuff DJ, Pupello DR. Comparison of hemiarthroplasty and reverse shoulder arthroplasty for the treatment of proximal humeral fractures in elderly patients. J Bone Joint Surg. 2013; 95:2050-5. Hart ND, Clark JC, Krause W, Kissenberth MJ, Bragg WE, Hawkins RJ. Glenoid screw position in the Encore reverse shoulder prosthesis: an anatomic dissection study of screw relationship to surrounding structures. J Shoulder Elbow Surg. 2013; 22:814-820.

Levy JC. Avoiding cement bone necrosis effect on tuberosity healing: the "black-and-tan" technique. Tech Should Surg. 2013 Sep; 14(3):81-84.

Virani NA, Cabezas A, Gutiérrez S, Santoni BG, Otto R, Frankle M. Reverse shoulder arthroplasty components and surgical techniques that restore glenohumeral motion. J Shoulder Elbow Surg. 2013 Feb; 22(2):179–87.

Puskas B, Harreld K, Clark R, Downes K, Virani NA, Frankle M. Isometric strength, range of motion, and impairment before and after total and reverse shoulder arthroplasty. J Shoulder Elbow Surg. 2013 Jan.

Andersen JR, Williams CD, Cain R, Mighell M, Frankle M. Surgically treated humeral shaft fractures following shoulder arthroplasty. J Bone Joint Surg Am. 2013 Jan; 95(1):9-18.

Affonso J, Nicholson GP, Frankle MA, Walch G, Gerber C, Garzon-Muvdi J, McFarland EG. Complications of the reverse prosthesis: prevention and treatment. Instr Course Lect. 2012; 61:157–68.

Cuff D, Clark R, Pupello D, Frankle M. Reverse shoulder arthroplasty for the treatment of rotator cuff deficiency: a concise follow-up, at a minimum of five years, of a previous report. J Bone Joint Surg Am. 2012 Nov; 94(21):1996-2000.

Zavala JA, Clark JC, Kissenberth MJ, Tolan SJ, Hawkins RJ. Management of deep infection after reverse total shoulder arthroplasty: a case series. J Shoulder Elbow Surg. 2012 Oct; 21(10):1310-5. Kwon YW, Pinto VJ, Yoon J, Frankle MA, Dunning PE, Sheikhzadeh A. Kinematic analysis of dynamic shoulder motion in patients with reverse total shoulder arthroplasty. J Shoulder Elbow Surg. 2012 Sep; 21(9):1184-90.

Willis M, Min W, Brooks JP, Mulieri P, Walker M, Pupello D, Frankle M. Proximal humeral malunion treated with reverse shoulder arthroplasty. J Shoulder Elbow Surg. 2012 Apr; 21(4):507-13.

Walker M, Willis MP, Brooks JP, Pupello D, Mulieri PJ, Frankle MA. The use of the reverse shoulder arthroplasty for treatment of failed total shoulder arthroplasty. J Shoulder Elbow Surg. 2012 Apr; 21(4):514-22.

Clark JC, Ritchie J, Song FS, Kissenberth MJ, Tolan SJ, Hart ND, Hawkins RJ. Complication rates, dislocation, pain, and postoperative range of motion after reverse shoulder arthroplasty in patients with and without repair of the subscapularis. J Shoulder Elbow Surg. 2012 Jan; 21(1):36-41.

Levy JC, Badman, B. Reverse shoulder prosthesis for acute four-part fracture: tuberosity fixation using a horseshoe graft. J Orthop Trauma 2011; 25:318–324.

Walker M, Brooks J, Willis M, Frankle M. How reverse shoulder arthroplasty works. Clin Orthop Relat Res. 2011 Sep; 469(9):2440-51.

Cheung E, Willis M, Walker M, Clark R, Frankle MA. Complications in reverse total shoulder arthroplasty. J Am Acad Orthop Surg. 2011 Jul; 19(7):439-49.

Gutiérrez S, Walker M, Willis M, Pupello DR, Frankle MA. Effects of tilt and glenosphere eccentricity on baseplate/bone interface forces in a computational model, validated by a mechanical model, of reverse shoulder arthroplasty. J Shoulder Elbow Surg. 2011 Jul; 20(5):732-9.

References

- Gutierrez S, Comiskey C, Lou Z, Pupello D, Frankle M. Range of Impingement-Free Abduction and Adduction Deficit After Reverse Shoulder Arthroplasty. Hierarchy of Surgical and Implant-Design-Related Factors. J Bone Joint Surg Am. 2008 Dec;90(12):2606-15.
- Simovitch RW, Zumstein MA, Lohri E, Helmy N, Gerber C. Predictors of scapular notching in patients managed with the Delta III reverse total shoulder replacement. *J Bone Joint Surg Am*. 2007 Mar;89(3):588-600.
- Levy JC, Everding NG, Frankle MA, Keppler LJ. Accuracy of patient-specific guided glenoid baseplate positioning for reverse shoulder arthroplasty. J Shoulder Elbow Surg. 2014 Jan;23:1563-1567.



Proven Results - continued

Cuff D, Levy JC, Gutiérrez S, Frankle MA. Torsional stability of modular and non-modular reverse shoulder humeral components in a proximal humeral bone loss model. J Shoulder Elbow Surg. 2011 Jun; 20(4):646-51.

Harreld KL, Puskas BL, Frankle M. Massive rotator cuff tears without arthropathy: when to consider reverse shoulder arthroplasty. J Bone Joint Surg Am. 2011 May 18; 93(10):973-84.

Mulieri P, Dunning P, Klein S, Pupello D, Frankle M. Reverse shoulder arthroplasty for the treatment of irreparable rotator cuff tear without glenohumeral arthritis. J Bone Joint Surg Am. 2010 Nov; 92(15):2544-56.

Holcomb JO, Hebert DJ, Mighell MA, Dunning PE, Pupello DR, Pliner MD, Frankle MA. Reverse shoulder arthroplasty in patients with rheumatoid arthritis. J Shoulder Elbow Surg. 2010 Oct; 19(7):1076-84.

Harreld KL, Puskas BL, Andersen J, Frankle, MA. Reverse shoulder arthroplasty in the management of irreparable rotator cuff tears without arthritis. JBJS Essential Surgical Techniques, 2010 Sep; 1(2):e12 1-15.

Klein SM, Dunning P, Mulieri P, Pupello D, Downes K, Frankle MA. Effects of acquired glenoid bone defects on surgical technique and clinical outcomes in reverse shoulder arthroplasty. J Bone Joint Surg Am. 2010 May; 92(5):1144-54.

Frankle MA, Teramoto A, Luo ZP, Levy JC, Pupello D. Glenoid morphology in reverse shoulder arthroplasty: classification and surgical implications. J Shoulder Elbow Surg. 2009 Nov-Dec; 18(6):874-85.

Holcomb JO, Cuff D, Petersen SA, Pupello DR, Frankle MA. Revision reverse shoulder arthroplasty for glenoid baseplate failure after primary reverse shoulder arthroplasty. J Shoulder Elbow Surg. 2009 Sep-Oct; 18(5):717-23. Gutiérrez S, Luo ZP, Levy J, Frankle MA. Arc of motion and socket depth in reverse shoulder implants. Clin Biomech. 2009 Jul; 24(6):473-9.

Chacon A, Virani N, Shannon R, Levy JC, Pupello D, Frankle M. Revision arthroplasty with use of a reverse shoulder prosthesis-allograft composite. J Bone Joint Surg Am. 2009 Jan; 91(1):119-27.

Gutierrez S, Levy JC, Lee WE 3rd, Luo ZP. Hierarchy of stability factors in reverse shoulder arthroplasty. Clin Orthop Relat Res. 2008 466:670-676.

Cuff D, Pupello D, Virani N, Levy J, Frankle M. Reverse shoulder arthroplasty for the treatment of rotator cuff deficiency. J Bone Joint Surg. 2008; 90:1244-1251.

Gutiérrez S, Comiskey CA 4th, Luo ZP, Pupello DR, Frankle MA. Range of impingement-free abduction and adduction deficit after reverse shoulder arthroplasty. Hierarchy of surgical and implant-design-related factors. J Bone Joint Surg Am. 2008 Dec; 90(12):2606-15.

Gutiérrez S, Levy JC, Frankle MA, Cuff D, Keller TS, Pupello DR, Lee WE 3rd. Evaluation of abduction range of motion and avoidance of inferior scapular impingement in a reverse shoulder model. J Shoulder Elbow Surg. 2008 Jul-Aug; 17(4):608-15.

Virani NA, Harman M, Li K, Levy J, Pupello DR, Frankle MA. In vitro and finite element analysis of glenoid bone/baseplate interaction in the reverse shoulder design. J Shoulder Elbow Surg. 2008 May-Jun; 17(3):509-21.

Cuff DJ, Virani NA, Levy J, Frankle MA, Derasari A, Hines B, Pupello DR, Cancio M, Mighell M. The treatment of deep shoulder infection and glenohumeral instability with debridement, reverse shoulder arthroplasty and postoperative antibiotics. J Bone Joint Surg Br. 2008 Mar; 90(3):336-42. Gutiérrez S, Levy JC, Frankle MA, Lee WE 3rd, Keller TS, Maitland ME. Center of rotation affects abduction range of motion of reverse shoulder arthroplasty. Clin Orthop and Relat Res. 2007.

Gutiérrez S, Greiwe RM, Frankle MA, Siegal S, Lee WE 3rd. Biomechanical comparison of component position and hardware failure in the reverse shoulder prosthesis. J Shoulder Elbow Surg. 2007 May-Jun; 16(3 Suppl):S9-S12.

Levy JC, Virani N, Pupello D, Frankle M. Use of the reverse shoulder prosthesis for the treatment of failed hemiarthroplasty in patients with glenohumeral arthritis and rotator cuff deficiency. J Bone Joint Surg Br. 2007 Feb; 89(2):189-95.

Levy J, Frankle M, Mighell M, Pupello D. The use of the reverse shoulder prosthesis for the treatment of failed hemiarthroplasty for proximal humeral fracture. J Bone Joint Surg Am. 2007 Feb; 89(2):292-300.

Frankle M, Levy JC, Pupello D, Siegal S, Saleem A, Mighell M, Vasey M. The reverse shoulder prosthesis for glenohumeral arthritis associated with severe rotator cuff deficiency. a minimum two-year follow-up study of sixty patients surgical technique. J Bone Joint Surg Am. 2006 Sep; 88 Suppl 1 Pt 2:178-90.

Frankle M, Siegal S, Pupello D, Saleem A, Mighell M, Vasey M. The Reverse Shoulder Prosthesis for glenohumeral arthritis associated with severe rotator cuff deficiency. A minimum two-year follow-up study of sixty patients. J Bone Joint Surg Am. 2005 Aug; 87(8):1697-705.

Harman M, Frankle M, Vasey M, Banks S. Initial glenoid component fixation in "reverse" total shoulder arthroplasty: a biomechanical evaluation. J Shoulder Elbow Surg. 2005 Jan-Feb; 14(1 Suppl S):162S-167S.

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* Data on file at DJO Surgical

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