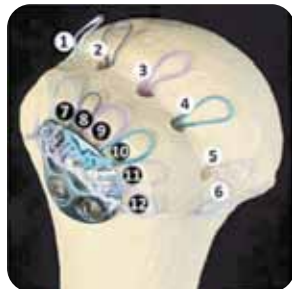


While patient age, tear chronicity, tear size, and patient comorbidities are all beyond the physician's control, a successful cuff repair still depends upon the surgeon's judgement in the following areas:



### Selecting the right suturing technique

More sutures and more passes through the tendon result in **more secure fixation**. Multiple holes in the plate serve as tying points for suture.



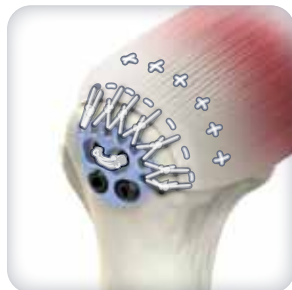
### Augmentation of the tendon

The CRP provides a nice way to suture the patch to the tendon and to the bone.



### Selecting the best anchoring method

The CRP makes the best use of **existing bone quality**, even in cases of osteopenia and where bony defects are present.

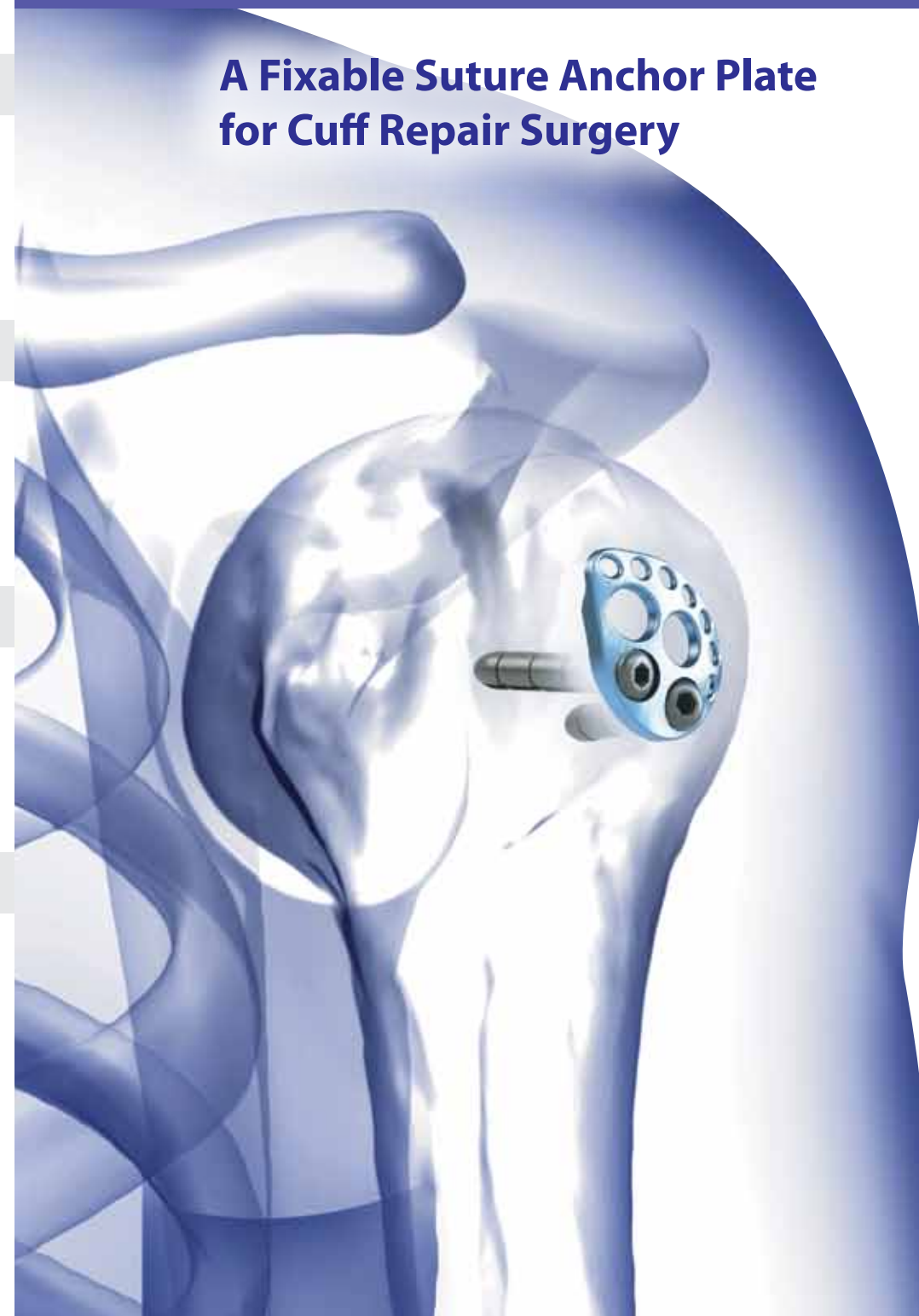


### Structuring the biological healing environment

Lateral and medial suture rows maximize **tendon-to-bone contact** with a multiplicity of suture tying points for the best possible distribution of force while minimizing foreign bodies within the bone.

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3. M. Baleani, S. Schrader, C. A. Veronesi, R. Rotini, R. Giardino, A. Toni: Surgical repair of the rotator cuff: a biomechanical evaluation of different tendon grasping and bone suture fixation techniques.
4. Hughes RE, An KN: Force analysis of rotator cuff muscles. *Clin Orthop Relat Res* 1996;330:75-83.
5. Juul-Kristensen B, Bojsen-Moller F, Finsen L, et al: Muscle sizes and moment arms of rotator cuff muscles determined by magnetic resonance imaging. *Cells Tissues Organs* 2000;167:214-222.
6. Burkhart SS, Wirth MA, Simonich M, Salem D, Lanctot D, Athanasiou K. Knot security in simple sliding knots and its relationship to rotator cuff repair: how secure must the knot be? *Arthroscopy* 2000;16:202-7.
7. Cummins, C. and G. Murrell (2003). "Mode of failure for rotator cuff repair with suture anchors identified at revision surgery." *Journal of Shoulder and Elbow Surgery* 12(2): 128-133.
8. Ozbaydar M; Elhassan B; Warner JJP: The Use of Anchors in Shoulder Surgery: A Shift From Metallic to Bioabsorbable Anchors. *Arthroscopy: The Journal of Arthroscopic and Related Surgery*, Vol 23, No 10 (October), 2007: pp 1124-1126

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## A Fixable Suture Anchor Plate for Cuff Repair Surgery

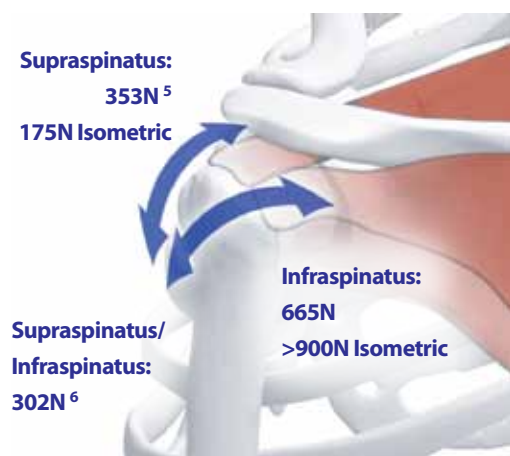
### 57% of Massive Rotator Cuff Repairs Fail<sup>2</sup>

Tear size is the best intra-operative predictor of repair integrity post-rotator cuff repair. As tear-size increases, the re-tear rate increases: ≤ 2 cm<sup>2</sup> (10%), 2-4 cm<sup>2</sup> (16%), 4-6 cm<sup>2</sup> (31%), 6-8 cm<sup>2</sup> (50%), >8 cm<sup>2</sup> (57%).

#### The Suture-Tendon Interface is the Weak Link in Cuff Tear Repair<sup>3</sup>

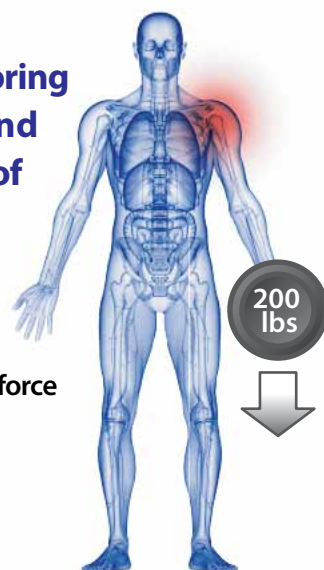
Given the forces placed upon the rotator cuff tendons, it is crucial to select the best combination of suturing technique and anchoring method.

#### Forces of Greater Than 900N may be placed upon the Rotator Cuff<sup>4</sup>



#### Will your anchoring technique stand up to this kind of force?

900N = Over 200 lbs force



The Cuff Repair Plate (CRP) is the first fixable suture anchor plate. It provides multiple suture tying points from a single device designed to improve anchorage-to-bone strength during cuff repair surgery.<sup>1</sup> The CRP is intended for augmentation of transosseous rotator cuff repair, especially in massive tears and reruptures in proximity to osteopenic bone.

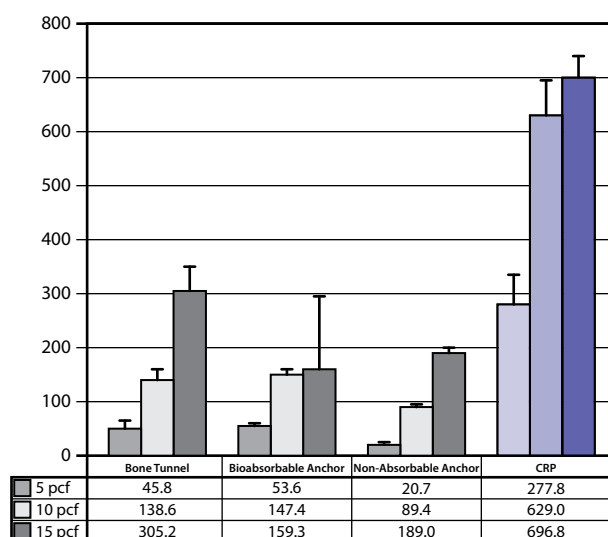
#### Massive Tears = More sutures

Even the strongest suture technique requires multiple sutures for large tears.

Suture Technique	Tensile Strength
Simple (1 pass)	47 N
Lasso-loop (1 pass)	65 N
Mattress (2 pass)	67 N
Double-Cinch (2 pass)	97 N
Modified Mason-Allen (3 pass)	128 N
Lasso-Mattress (2 pass)	148 N
Massive Cuff (3 pass)	151 N

More sutures and more passes through the tendon result in more secure fixation with a lower likelihood of soft tissue failure<sup>7</sup>. Choosing the right suture for the right application is critical. The CRP accommodates multiple sutures, providing appropriate distribution of forces between the anchor and augmented tendon.

#### CRP Pullout Strength Compared to Alternative Anchoring Methods



#### More Sutures = More Anchors

Multiple anchors are required to accommodate the sutures necessary for large tear repair.



High loads are placed on individual anchors because they are coupled only through tendon and suture.

Multiple suture anchors place a biological burden upon the patient's anatomy. Complications from suture anchors include loosening, migration, incarceration of the implant within the joint, and difficulty with revision surgery<sup>8</sup>. Bioabsorbable anchors come with additional risks, including anchor breakage due to brittleness and/or the development of bony cysts in the area of anchor absorption.

In a recent in vitro study, the CRP demonstrated superior anchorage strength compared to suture anchors under conditions of osteopenia. Under such conditions, the load to failure for the CRP was up to 13X greater than that of a metal suture anchor. Based on these results, the authors feel that use of a fixable suture anchor plate such as the CRP might help to minimize the risk of component migration and its associated complications during rotator cuff repair in patients with osteopenic bone.

#### Tendon to Bone, not Tendon to Anchor

The goal during surgical repair of the rotator cuff is to restore the normal tendon-to-bone attachment while minimizing motion at the tendon-bone interface. For large cuff tears, multiple suture fixation points are needed to achieve this. While some surgeons advocate the use of multiple anchors to provide multiple suture fixation points, we believe that as the greater tuberosity is filled with more and more anchors there exists the possibility of creating a "biological burden" as the normal bone is replaced with foreign material. It is reasonable to expect the cuff tendons to heal to bone, but not to metal, PEEK, or PLGA.

As opposed to suture anchors, CRP fixation occurs distal to the rotator cuff footprint. This leaves the tendon-to-bone interface free of foreign material that might otherwise interfere with healing.

