

The image displays several components of the Trabecular Metal Reverse Plus (TMR+) Shoulder System. In the foreground, a large, polished metal acetabular cup is shown with a porous, trabecular metal liner. Behind it, several cylindrical metal components, likely the humeral heads, are arranged in a row, receding into the background. These heads feature a similar porous metal surface on their top and bottom surfaces, and a smooth metal shaft in the middle. The components are set against a clean, white background with soft shadows, highlighting their metallic texture and complex geometry.

# Trabecular Metal Reverse Plus™ (TMR+™)

Shoulder System

**Trusted. Modernized. Simplified.**



ZIMMER BIOMET  
Your progress. Our promise.®

**TMR+** Shoulder System advances the TM Reverse glenoid solution that already demonstrates 12+ years of **clinical history**, and utilizes Trabecular Metal™ material for **biological fixation**. TMR+ System is designed to enable better<sup>†</sup> **biomechanical optimization** and **surgical ease of use** to deliver confidence in achieving the desired clinical outcomes, and in helping you restore mobility and alleviate pain for your patients.



# Biomechanical Optimization

Glenosphere inferior overhang and broad range of lateral offsets to enable **optimal range of motion** and **avoidance of scapular notching**<sup>1</sup>.

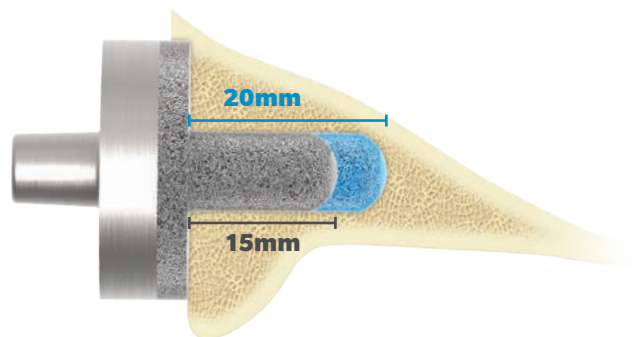


Lateralization options of +0, +3 and +5mm, along with inferior overhang of the glenosphere



Enhanced taper mechanism designed to align readily for **definitive engagement** of glenosphere and baseplate.

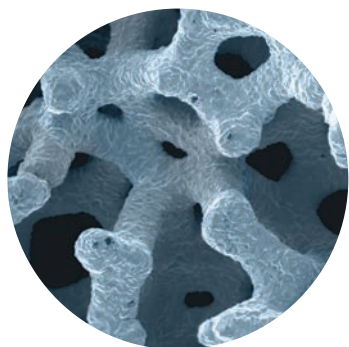
Four post options (15, 20, 25 and 30mm) devised to accommodate various glenoid morphologies allowing for **fit** to patient anatomy.



The new post length of 20mm provides 33% greater contact surface area between cancellous bone and Trabecular Metal material for bone ingrowth, as compared to 15mm post length

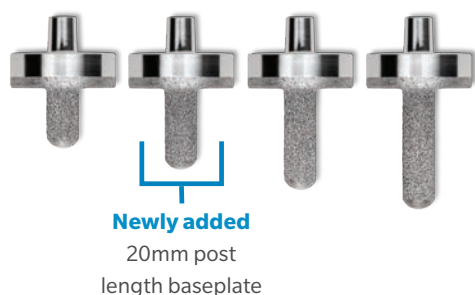
## Biological Fixation

**Trabecular Metal** material closely resembles the **structure, function and physiological properties of cancellous bone.**<sup>2,3</sup>



Pore size and shape of Trabecular Metal material is shown to support **bony ingrowth** and **vascularization.**<sup>\*,4</sup>

Trabecular Metal material has a high coefficient of friction (0.98) against cancellous bone for **initial implant stability.**<sup>\*\*5</sup>

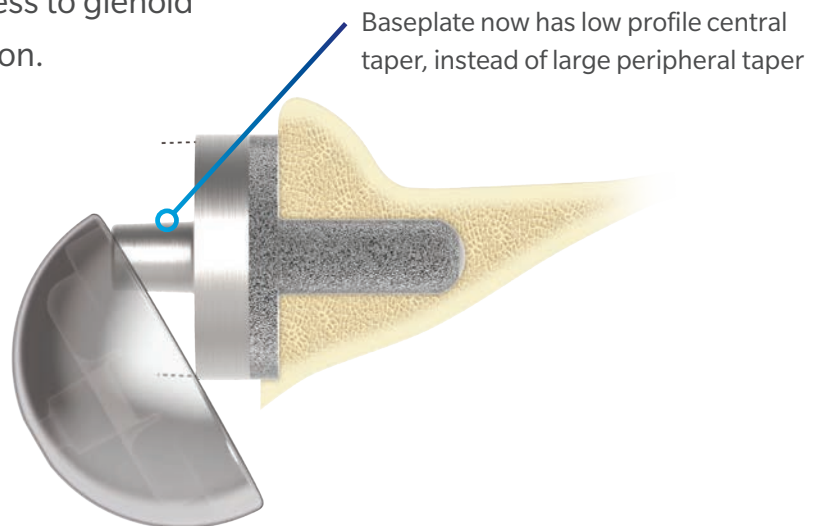


**Over 300 publications** over a span of 20 years documenting effectiveness of Trabecular Metal technology in a variety of applications.<sup>6</sup>

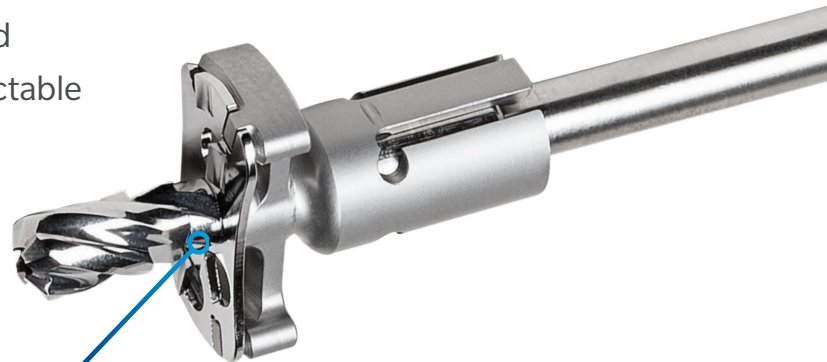
TMR+ design leverages **12+ years of proven clinical usage** of Trabecular Metal Reverse Shoulder System that has exhibited **great survivorship performance.**<sup>7-13</sup>

## Surgical Ease and Efficiency

Low profile taper **takes 36% less volume**<sup>†</sup> in constrained joint space allowing for enhanced access to glenoid during glenosphere insertion.



**Sharp and low profile reamer** constructed to provide easier access to glenoid and predictable reaming performance for every surgery.



Reams for backside of baseplate and prepares center hole in one step



Advanced glenosphere removal instrument designed for **rapid extraction of glenosphere**, with **nominal force<sup>†</sup>**, and **without compromising stability of the baseplate**.

Updated glenoid preparation technique and advanced instrumentation option allow for **reduction in number of surgical steps**.

**Redesigned instrument set** aimed at improving efficiency and intuitiveness of instrumentation through the surgical flow across the instrument set.



**Complete compatibility** between **TMR+ glenoid** construct and humeral constructs of **Comprehensive® Reverse** and **Trabecular Metal Reverse Shoulder** system



**References:** \* Laboratory and animal data are not necessarily indicative of clinical performance. \*\* For net-shaped Trabecular Metal. † As compared to Trabecular Metal Reverse Shoulder System. **1.** Gutierrez *et al.* Evaluation of abduction range of motion and avoidance of inferior scapular impingement in a reverse shoulder model. *J Shoulder Elbow Surg* 2008; 17: 608-15. **2.** Bobyn JD, *et al.* Characteristics of bone ingrowth and interface mechanics of a new porous tantalum biomaterial. *Journal of Bone and Joint Surgery (Br)*. 81-B:907-14,1999. **3.** Bobyn JD, *et al.* Characterization of a new porous tantalum biomaterial for reconstructive orthopaedics. Scientific Exhibit, Proc AAOS, Anaheim, Calif, 1999. **4.** Karageorgiou, *et al.* Porosity of 3D biomaterial scaffolds and osteogenesis. *Biomaterials*. 26:5474-91, 2005. **5.** Y Zhang, *et al.* Interfacial Frictional Behavior: Cancellous Bone, Cortical Bone, and a Novel Porous Tantalum Biomaterial, *Journal of Musculoskeletal Research* 1999; 3:4, 245-251. **6.** TM Publications Index © 2018 Zimmer. Data on file. **7.** Hip, Knee & Shoulder Arthroplasty Annual Report 2018. AOANJRR. **8.** ODEP 2019. <http://www.odep.org.uk/products.aspx?typeid=4>. Latest ODEP ratings can be found at [www.odep.org.uk](http://www.odep.org.uk) **9.** K. Theivendran *et al.* Reverse total shoulder arthroplasty using a trabecular metal glenoid base plate – Functional and Radiological outcomes at two to five years. *The Bone & Joint Journal* Jul 2016; 98-B: 969-75. **10.** A. Bogle *et al.* Radiographic results of fully uncemented trabecular metal reverse shoulder system at 1 and 2 years’ follow-up. *J Shoulder Elbow Surg* 2013; 22: e20-e25. **11.** Kowalsky *et al.* The relationship between scapular notching and reverse shoulder arthroplasty prosthesis design. *J Shoulder Elbow Surg* 2012; 21: 1430-41. **12.** Kempton *et al.* A radiographic analysis of the effects of prosthesis design on scapular notching following reverse total shoulder arthroplasty. *J Shoulder Elbow Surg* 2011; 20: 571-76. **13.** V. Nanavati *et al.* Glenoid Fixation Optimization in Reverse Shoulder Implants. 54th Annual Meeting of the Orthopaedic Research Society. Paper No. 226.



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