Restoration Acetabular Wedge Augments, united with Tritanium, Trident, MDM and X3 technologies, is an evolutionary advantage in Total Hip Arthroplasty

Advanced Fixation

Versatility

Simplicity

Restoration Acetabular Wedge Augments are designed to aid in the reconstruction of minimal to severe bone defects. They provide intraoperative flexibility through optimized screw placement and versatile implant sizing and positioning.

- **Advanced Fixation** – Tritanium Porous Technology, optimized screw placement

- **Versatility** – Broad range of implant sizes, adaptable implant geometry and orientation for various defects

- **Simplicity** – Minimal bone removal, simplified trial to implant placement, intuitive and streamlined instrumentation

Design Rationale

Material

The Restoration Acetabular Wedge Augments are manufactured from patented Tritanium Advanced Fixation Technology. Tritanium is created using commercially pure Titanium (CPTi)—a biologically compatible material. The Titanium matrix, resulting in a porous bulk foam structure, closely resembles trabecular bone (Figure 1).2

Wedge Augment material characteristics include:

- Average Porosity: 63%3
- Coefficient of friction: 1.014

Figure 1: Magnified view of Tritanium matrix

Ancillary Fixation

Each Wedge Augment is designed to optimize the number of screw hole options and screw placement to provide enhanced initial stability of the augment.5 Each screw hole allows for a varying degree of angulation, up to 18°, to help achieve purchase with good bone. Either GAP (2080-00XX) or Osteolock (5260-5-0XX) 6.5mm screws can be used to obtain rigid fixation of the Wedge Augment against host bone.
Instrumentation

Ease of Use

The Restoration Wedge Augment instruments, encompassed in a single tray, are simple and easy to use for trialing and implantation. The system is streamlined to include Wedge Augment Trials and a small number of Core Instruments for procedural simplification.

The Wedge Augment Trials mimic the geometry of the implants and are color-coded according to OD size. Each trial has the same screw hole configuration as the implant to serve as a visual aid for the location of screws.

Simplified Placement

The Restoration Acetabular Augment system was designed with provisions for Kirschner Wires (K-wires) to simplify the placement of the trials and to help the surgeon replicate trial positioning with the implant.
Wedge Features

- Tritanium bulk foam
- Range of OD sizes and thickness for spectrum of defects
- Optimized screw holes
- K-Wire holes for simplified placement

Product Specifications

The Wedge Augments are offered in 18 different sizes consisting of six outer diameter (OD) sizes. The OD sizes range from 46mm to 66mm in 4mm increments. The corresponding inner diameter (ID) for each size is 2mm larger than the OD. For each wedge augment, there are three thickness options. See Table 1.

Table 1

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<th>Thickness (mm)</th>
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The MDM X3 Mobile Bearing Hip System is the latest addition to Stryker’s comprehensive solution for both primary and revision total hip arthroplasty (THA). MDM X3 is designed to address stability, implant longevity and advanced fixation—helping orthopaedic surgeons with a wide breadth of reconstruction challenges they may face in hip surgeries.

**Tritanium, Trident and X3**

Tritanium Advanced Fixation Technology, developed from commercially pure Titanium (CPTi)—a biologically compatible material, is applied to Stryker’s Multi-Hole shell to aid in revision THA.

Trident, an evolutionary shell design with over 10 years of clinical history, has demonstrated the lowest revision rate (2.4%) among cementless cups at five years according to the 2010 National Joint Registry of England and Wales.

Both the Tritanium and Trident Acetabular Systems feature a patented locking mechanism that outperforms competitive designs in laboratory testing, and is designed to minimize backside wear and maximize jump distance for increased stability. Compatible with X3 Advanced Bearing Technology, Tritanium and Trident provide solutions for the range of hip surgeries.

**The Power of X3**

The patented X3 Advanced Bearing Technology is designed to minimize the risk of wear and consequently help prolong the life of the implant. X3 has demonstrated a 97% reduction in wear compared to conventional polyethylene.

The Restoration Modular Stem System is designed to allow surgeons to independently achieve the main goals of hip surgery—attain solid fixation and restore hip biomechanics, all with a straightforward set of instrumentation.

**Versatility**

- System addresses femoral Type 1 through Type 4 revisions

**Stability**

- Designed to allow for restoration of proper biomechanics through independent adjustment of leg length, offset and version

**Simplicity**

- Simple, straightforward instrumentation to allow for OR efficiency

**The Restoration Modular Stem System**
A surgeon must always rely on his or her own professional clinical judgment when deciding whether to use a particular product when treating a particular patient. Stryker does not dispense medical advice and recommends that surgeons be trained in the use of any particular product before using it in surgery.

The information presented is intended to demonstrate the breadth of Stryker product offerings. A surgeon must always refer to the package insert, product label and/or instructions for use before using any Stryker product. Products may not be available in all markets because product availability is subject to the regulatory and/or medical practices in individual markets. Please contact your Stryker representative if you have questions about the availability of Stryker products in your area.

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References
3. Stryker Test Report RD-10-044
4. Stryker Test Report RD-07-077
5. Stryker Test Report RD-10-050
8. The National Joint Registry of England and Wales, Annual Report 2010. Table 3.3. Based on revision rates according to cup brands for primary hip replacement procedures, undertaken between 1st April 2003 and 31st December 2009, which were linked to a HES/EPJW episode.
11. Stryker Orthopaedics Restoration® ADM X3® 28 mm ID acetabular inserts made of X3® Gas Plasma Sterilized UHMWPE, showed a 97% reduction in volumetric wear rate versus 28 mm ID Restoration® ADM Duration Gamma Radiation Sterilized UHMWPE. Both ADM constructs utilized a 54mm OD shell and the inserts were approximately 9.9 mm thick. Testing was conducted under multi-axial hip joint simulation for 5 million cycles using a 28mm CoCr modular femoral head articulating counterface and calf serum lubricant. Volumetric wear rates were 109.7±6.0 mm³/10⁶ cycles and -1.03±3.8 mm³/10⁶ cycles for Duration and X3 polyethylene insert test samples. Although in-vitro hip wear simulation methods have not been shown to quantitatively predict clinical wear performance, the current model has been able to reproduce correct wear resistance rankings for some materials with documented clinical results. 1-3