For surgeons who want to treat acetabular defects,¹ the Trabecular Metal Acetabular Revision System (TMARS) is easy to use, durable and utilizes proven Trabecular Metal Technology with clinical history of 17+ years.¹⁹-²¹ It addresses the need for initial stability and long term biologic fixation.
Approach Acetabular Revision Cases with Confidence
Easy to Use

No Structural Allograft Preparation

The need for allograft bone preparation is virtually eliminated, saving precious surgical time.

One Comprehensive Modular System

The Trabecular Metal Modular Acetabular Revision System (TMARS) has the flexibility for mixing and matching implants intraoperatively enabling more efficient case management and execution in the OR relative to what other implant systems can offer.3,5,11 Important time savings is realized before and during surgery.

Trabecular Metal Augments

- Interfaces are cemented against the Trabecular Metal Revision Shell, creating a monolithic construct without concerns of micromotion

Trabecular Metal Cup-Cage Constructs

- Cage can be contoured to fit the acetabulum while providing mechanical stability of the Cup-Cage construct until biological ingrowth occurs within the Trabecular Metal Revision Shell

Trabecular Metal Buttress & Shim Augments

- Sizing allows use with Trabecular Metal Revision Shells of any size
- Shims placed between Buttress Augment flange and host bone optimize the fit of the device against the iliac bone

Trabecular Metal Revision Shells & Liners

- Trabecular Material allows excellent cement interdigitation between liner and revision shell
- Cemented liner allows for placement at the exact coverage angle and has a grooved backside to provide rotational stability
Durable

No Graft Resorption
Use of TMARS eliminates the concern about graft vascularization and resorption and eventual collapse. This also eliminates the need for a future revision due to lack of graft incorporation.

No Disease Transmission
Use of TMARS alleviates concerns about disease transmission that may be caused by use of a donor graft.

Great Potential for Biologic Ingrowth
Trabecular Metal Technology offers a high coefficient of friction which helps reduce micromotion, enabling tissue growth. Its 3D construct provides a high level of porosity and potential for ostoconductivity allows for more rapid in-growth supporting a vascularized structure to maintain healthy bone. Implant durability leads to longevity and reduced risk for future surgeries.

Failure of structural allograft after 12 years.
Proven Technology

Clinical Success

Trabecular Metal Technology has more than 17 years of clinical history with orthopaedic implants and over 75 peer-reviewed journal publications have been issued, providing additional confidence in this technology.19-21

Pre-Op: Uncontained Segmental Defect, >50% of Acetabulum

Pre-Op: Uncontained Bone Loss, <50% of Acetabulum

Pre-Op: Uncontained Segmental Defect, >50% of Acetabulum
Full Range of Revisions Successfully Treated$^{1,2,12,16-18}$

An array of revision cases ranging from simple to extremely complex has been effectively treated with *Trabecular Metal* implants. Defects spanning Paprosky Type I through IV have been successfully treated with the *Trabecular Metal* Acetabular Revision system.
Appendix

A Step-Wise Algorithmic Approach to Challenging Revisions

While other algorithmic approaches may be used to discuss acetabular revision, this brochure uses Paprosky’s classification of acetabular defects to explain the usage of Trabecular Metal Acetabular Revision System Components. This approach provides preoperative indications to predict defects and solutions intraoperatively. It is based on the severity of bone loss and the ability to obtain cementless fixation for a given bone-loss pattern. This system can be used as a guide to maximize contact between the host bone and the Trabecular Metal Components, thus optimizing mechanical stability.

### Paprosky Classification

<table>
<thead>
<tr>
<th>Defect Type</th>
<th>Defect Characteristics</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Acetabular rim, anterior column, and posterior column intact and supportive; small, local, contained defects</td>
</tr>
<tr>
<td>IIA</td>
<td>Moderate superomedial migration &lt;3cm; &gt;50% host-bone contact</td>
</tr>
<tr>
<td>IIB</td>
<td>Moderate superolateral migration &lt;3cm; &gt;50% host-bone contact</td>
</tr>
<tr>
<td>IIC</td>
<td>Isolated medial migration, medial to Kohler’s line; intact rim</td>
</tr>
<tr>
<td>IIIA</td>
<td>Severe superolateral migration &gt;3cm; 40-60% host-bone contact; inadequate stability; defect &lt;½ circumference</td>
</tr>
<tr>
<td>IIIB</td>
<td>Severe superomedial migration; &lt;40% host-bone contact; inadequate stability; medial to Kohler’s line; risk of pelvic discontinuity</td>
</tr>
</tbody>
</table>

### Pelvic Discontinuity

Partial or complete fracture

### Reconstruction Options

The integrity of the host-bone stock determines the reconstruction option available:

- Completely supportive acetabulum (ingrowth likely)—Trabecular Metal Revision Shell
- Partially supportive acetabulum (ingrowth possible)—Trabecular Metal Revision Shell with Augments
- Non-supportive (ingrowth unlikely)—Trabecular Metal Revision Shell with Buttress Augments and/or Cage

### Four Landmarks

Indications for component revision are dependent upon four radiographic criteria:

1. **Kohler’s Line**—integrity of medial wall and superior anterior column
2. **Acetabular Tear Drop**—integrity of medial wall and inferior portion of anterior and posterior column
3. **Ischial Lysis**—integrity of posterior wall and posterior column
4. **Vertical Migration**—integrity of superior dome
Type I & Type II Defects

Type I Defect
Kohler’s Line: Intact
Tear Drop: Intact
Ischial Lysis: Minimal to none
Vertical Migration: Minimal to none

Type IIA Defect
Kohler’s Line: Intact
Tear Drop: Violated
Ischial Lysis: Mild to moderate
Vertical Migration: Minimal to none

Type IIB Defect
Kohler’s Line: Intact
Tear Drop: Intact
Ischial Lysis: Mild
Vertical Migration: <3cm

Type IIC Defect
Kohler’s Line: Moderately violated
Tear Drop: Moderate lysis
Ischial Lysis: Minimal
Vertical Migration: Minimal to none

Solution
Trabecular Metal Revision Shell and Longevity® Highly Crosslinked Polyethylene Liner
- Designed to prevent backside micromotion
- Cement secures screws
- Isoelastic loading of bone
- Cemented Longevity Highly Crosslinked Polyethylene Liners with large-diameter heads, up to 40mm, for additional joint stability and range of motion
Type IIIA—Cavitary Defect

Radiograph of Defect

Example of Defect

Algorithmic Repair

**Type IIIA Cavitary Defect**

Kohler’s Line: Intact

Tear Drop: Minimal lysis

Ischial Lysis: Minimal

Vertical Migration: >3cm

**Solution**

*Trabecular Metal Augment in oblong cup position*[^16-18]

- Uses the *Trabecular Metal Augment* to fill the superior bone void and restore head center to natural anatomic position
- Cementing the *Trabecular Metal Revision Shell* to the augment creates a monolithic construct

[^16-18]: Reference numbers for further reading.
Type IIIA—Segmental Defect

**Type IIIA Segmental Defect**
Kohler's Line: Moderately violated but intact
Tear Drop: Minimal lysis
Ischial Lysis: Mild
Vertical Migration: >3cm

**Solution**
*Trabecular Metal Augment in flying buttress position*\(^{2,16-18}\)
- Uses the *Trabecular Metal* Augment, inverted, as a load-bearing structural support to replace the missing acetabular rim
- Cementing the *Trabecular Metal* Revision Shell to the augment creates a monolithic construct
Type IIIA—Extensive Segmental Defect

Kohler’s Line: Intact
Tear Drop: Minimal lysis
Ischial Lysis: Mild
Vertical Migration: >3cm

Solution

Trabecular Metal Buttress Augment
- Trabecular Metal Buttress Augment provides a superior step for placement against the ilium and is an alternative to allografts, which are expensive and tend to resorb
- Trabecular Metal Shim Augments are available to supplement the fit of the superior flange of the buttresses onto the ilium
- Cementing the Trabecular Metal Revision Shell to the augment creates a monolithic construct
Type IIIB—Contained Medial Defect

**Type IIIB Medial Defect**
- Kohler’s Line: Violated
- Tear Drop: Violated, significant lysis
- Ischial Lysis: Severe
- Vertical Migration: >3cm

**Solution**
*Trabecular Metal Augments* in footings position\(^{7,16-18}\)

- *Trabecular Metal Augments* sized to fit defect, providing a foundation for the shell and filling voids from medial and/or superior defects
- Cementing the *Trabecular Metal Revision Shell* to the augments creates a monolithic construct
Pelvic Discontinuity

- Superior aspect of pelvis is separated from the inferior aspect as a result of bone loss or an acetabular fracture

Solution

Cup-Cage Construct

- The Cage spans the acetabular defect and provides mechanical stability until biological ingrowth occurs within the Trabecular Metal Revision Shell
- Used in situations where the Trabecular Metal Revision Shell alone does not provide adequate stability
- The Trabecular Metal Revision Shell provides potential for bone ingrowth and long-term fixation
- Three components—shell, cage, and liner—cemented together create a monolithic construct
References


3. Biomet Brochure Y-BMT-977/011507/M

4. Depuy Brochure 7.5M1007 0612-38-506


12. Macheras GA et al., Eight to Ten-Year Clinical and Radiographic Outcome of a Porous Tantalum Monoblock Acetabular Component, JOA Vol. 00 No. 02008, In Press


17. Scott M. Sporer, MD, MS, and Wayne G. Paprosky, MD, FACS; Acetabular Revision Using a Trabecular Metal Acetabular Component for Severe Acetabular Bone Loss Associated With a Pelvic Discontinuity; J Arthroplasty Vol. 21 No. 6 Suppl. 2 2006.


Zimmer Trabecular Metal
Acetabular Revision System

Approach Acetabular Revision Cases with Confidence.

Easy to Use
No structural allograft preparation • One comprehensive modular system

Durable
No resorption issues • Potential for biologic in-growth

Proven Technology
17+ years of clinical history • Full range of revisions successfully treated

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