The coupling of the Triathlon design and the latest in highly porous biologic fixation technology led to the Triathlon Tritanium TKA.

Studies have shown strong survivorship with cementless TKA.\textsuperscript{1, 2} Since the introduction of Triathlon Tritanium TKA, clinical data from multiple centers have shown favorable early results.\textsuperscript{3-5}

### Triathlon Tritanium 2-year survivorship

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>99.95% at 2 years</td>
<td>Miller et al. 2017\textsuperscript{3}</td>
</tr>
<tr>
<td>99.5% at 2 years</td>
<td>Harwin et al. 2017\textsuperscript{4}</td>
</tr>
<tr>
<td>100% at 2 years</td>
<td>Buzhardt et al. 2017\textsuperscript{5}</td>
</tr>
</tbody>
</table>

### Clinical survivorship in Stryker cementless TKAs with over 10 years of follow-up

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>100% at 10 years and 96.7% at 13 years with Osteonics Series 3000</td>
<td>Watanabe et al. 2004\textsuperscript{1}</td>
</tr>
<tr>
<td>97.1% at 20 years with Stryker HA Omnifit (Series 3000 and 7000)</td>
<td>Epinette et al. 2014\textsuperscript{2}</td>
</tr>
</tbody>
</table>

### Initial stability

Given the importance of stable primary fixation,\textsuperscript{6} the keel and four bullet cruciform pegs on the Tritanium baseplate were designed to reduce micromotion and lift off.\textsuperscript{7, 8} The SOMA database of bone morphology was used to optimize the depth and placement of the pegs.\textsuperscript{9}

### Biologic fixation

Tritanium is a highly porous biologic fixation surface, which closely resembles the structure of cancellous bone.\textsuperscript{13} This technology is used on the baseplate and metal-backed patella.

Here is a diagram showing the size comparison of cancellous bone and Tritanium porous matrix.
Triathlon design

Stable primary fixation of the implant is a prerequisite for biologic fixation. Triathlon CR and PS systems are designed to minimize dynamic stress transfer to the tibial fixation interface by providing minimal resistance to rotation.

Triathlon and the single radius help to reduce sagittal rocking during ambulation by locating the bearing sulcus directly over the tibial keel.

References:


Tritanium metal-backed patella

The Tritanium metal-backed symmetric and asymmetric patellas allow for the following:

Biologic fixation

The bone-facing architecture and increased peg diameter have been designed to encourage biologic fixation.

Enhanced association

Direct compression molding allows the polyethylene to penetrate the 3D-printed porous metal surface to minimize dissociation.

Greater polyethylene thickness

A solid barrier layer between the porous surfaces can allow for a smaller metal backing and greater polyethylene thickness.

Triathlon design

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References:


