Designed for life
Implant technology with unmatched performance
Designed for life
Wear Performance
Biocompatibility
Real-life results
Designed for life
Wear performance

As today’s patients seek more active lifestyles than traditional patients, knee and hip implants will be expected to endure more stress without succumbing to wear. However, the functional lifetime demand of younger and active patients is 10-fold greater than the estimated functional lifetime of traditional polyethylene.\(^1\) VERILAST\textsuperscript{TM} Technology from Smith & Nephew is the only bearing technology with published results of 45 Million Cycles of hip and knee \textit{in vitro} wear simulation testing, R3\textsuperscript{®} Hip System and LEGION\textsuperscript{®} Primary Knee System, respectively. This means the replacement may be expected to provide improved wear performance. More importantly, if implanted earlier, it may restore patients to their active lifestyles sooner.

VERILAST Technology in the LEGION Primary Knee System demonstrates superior wear performance in 45 million cycle testing.

VERILAST Technology R3 Hip System demonstrates superior wear performance in 45 million cycle testing.

Comparison of the mean volumetric wear of CoCr/CPE after simulating 5 Mc of use and VERILAST after simulating 45 Mc respectively.\(^2\)

Comparison of the mean volumetric wear of CoCr/CPE and CoCr/XLPE at 7.8Mc and 45Mc respectively.\(^3\)

Multitude of options

Smith & Nephew is the only company to offer VERILAST Technology. With the combination of OXINIUM\textsuperscript{®} alloy and highly cross-linked polyethylene (XLPE), VERILAST Technology offers a complete array of beneficial hip and knee implant options.

Knee systems

VERILAST Technology is available through our GENESIS\textsuperscript{®} II, LEGION PRIMARY and JOURNEY II systems.

Hip systems

VERILAST Technology is available through our R3 Acetabular System, POLARCUP\textsuperscript{®} Dual Mobility System, and REFLECTION\textsuperscript{®} Acetabular System.
How many knee systems have been lab-tested to 30 years of simulated wear?  

**Just one:**  
LEGION™ Primary Knee System with VERILAST™ Technology

†The LEGION™ Primary CR Knee System completed 45 million cycles of *in vitro* simulated wear testing, which is an estimate of 30 years of activity. Other LEGION VERILAST Primary Knee Systems underwent similar lab testing comparable to industry standards. The results of *in vitro* wear simulation testing have not been proven to quantitatively predict clinical wear performance. Also, a reduction in total polyethylene wear volume or wear rate alone may not result in improved clinical outcomes as wear particle size and morphology are also critical factors in the evaluation of the potential for wear mediated osteolysis and associated aseptic implant loosening. Particle size and morphology were not evaluated as part of the testing.
Wear performance
VERILAST® Technology for Knees

VERILAST Technology is the peerless bearing combination of OXINIUM™ alloy and highly cross-linked polyethylene (XLPE). By combining the biocompatible, proprietary OXINIUM alloy with XLPE, Smith & Nephew’s VERILAST Technology in the LEGION® and JOURNEY® Knee Systems allow surgeons to address their patient’s knee pain earlier.

When comparing Smith & Nephew’s conventional technology to its XLPE technology, the XLPE technology provides an expected, significant reduction in wear rates. Moreover, when comparing Smith & Nephew’s XLPE technology to VERILAST Technology, there is another significant reduction in wear rates. Understanding these tests were conducted using pristine components, the differences in these wear rates would be even more pronounced with roughened components due to the resistance to micro-scratches of the VERILAST couple.

The implants identified below were tested by their manufacturers using different testing protocols and, therefore, the results are not directly comparable.

Mean volumetric wear rates of CoCr against conventional polyethylene (CPE), CoCr against crosslinked polyethylene (XLPE) and OXINIUM against XLPE as published by the respective companies with their respective implants. Please see reference section for testing information.
Metal sensitivity

Just as metal ions are a well described problem for many hip replacement patients, cobalt, chromium and nickel are commonly cited allergens for knee replacement patients. In several cases, sensitivity to one or more of the allergens has resulted in revisions for these patients.4-7

Surgeons should be aware that all metal implants contain varying amounts of cobalt, chromium, and nickel. When selecting the appropriate implant, surgeons should consider the composition of each implant before use. To help with this decision, VERILAST® Technology incorporates proprietary OXINUM® alloy. Unlike cobalt chrome, OXINUM alloy has <0.0035% nickel content and <0.02% chromium content.

Metal content of implants9

Clinical studies8

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<table>
<thead>
<tr>
<th>Maximum nickel content</th>
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<tr>
<td>OXINUM</td>
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<table>
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<th>Maximum chromium content</th>
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Ni content % by weight

Cr content % by weight
The perfect equation for hips
VERILAST° Technology for Hips

VERILAST Technology for hips from Smith & Nephew uses the exclusive bearing combination of proprietary OXINIUM® and highly cross-linked polyethylene, which provides superior clinical survivorship and biocompatibility without sacrificing versatility or introducing the risk of ceramic-like fracture. Most importantly, VERILAST Technology provides low wear, corrosion avoidance and real-life results.

Real-life results

In the 2014 Australian Registry, the ceramicised metal/ XL polyethylene category, which includes the exclusive OXINIUM alloy from Smith & Nephew, had the highest survivorship of all bearing categories at 10 years: 96.7%. See the 2014 Australian Registry Results inserts to read more.*

*Although the ceramicised metal/ cross-linked polyethylene combination has the lowest reported cumulative percent revision at five years this result should be interpreted with caution (Tables HT21 and HT24). It is the registry’s view that this articulation cannot be compared to other articulations as it has only been used with a small number of femoral stem and acetabular combinations from a single company. The results should not be compared due to the inability to correct for the confounding effect of the limited number of stem/acetabular combinations.

Wear performance

As patients today continue to go back to their active lifestyles, bearing longevity is more important. Wear reduction involving the bearing surfaces is critical to implant longevity. VERILAST Technology for total hip arthroplasty has been laboratory tested and shown to provide superior wear performance compared to CoCr on highly-crosslinked polyethylene, for up to 45 million cycles. With advanced materials designed to last, VERILAST Technology helps restore patients to their active lifestyles, allowing joint pain to be addressed earlier.

Cumulative volumetric wear comparison²
Corrosion avoidance

There is a growing concern in the orthopaedic community about fretting and corrosion at the head-neck taper junction. Recent studies have indicated that the choice of femoral head material can have a major impact on the presence of corrosion in vivo. With its biocompatible properties, due to its use of oxidized zirconium, VERILAST™ Technology has shown to reduce taper corrosion in total hip arthroplasty, minimizing the concern of trunnionosis. This makes VERILAST Technology the optimal solution for total hip arthroplasty.21-22

A recent Rush University study compared Co-alloy, Ti-alloy, and Zr-Oxide alloy (OXINUM™). This study showed that OXINUM Technology produces less material debris. Additionally, it showed “less toxicity and inflammation in peri-implant cells than either Ti-alloy or Co-alloy, in vitro.”23

A study by Pawar et al.21 used an acidic fretting test to compare the potential corrosive and fretting responses of OXINUM (OxZr), cobalt chrome (CoCr) and stainless steel (StSt) femoral heads.

Method
• 4 head taper combinations were used:
  • CoCr/ Ti64
  • OxZr/ Ti64
  • StSt/StSt
  • OxZr/ StSt
• 3.5 pH solution used to submerge head neck junction
• Test run for over 5 Mcycles at 50° C

“The OxZr heads coupled with Ti-6Al-4V and SS trunnions showed the least chemical attack on either the head or the trunnion.”21
Designed for life
References

15. Biomet publication, FDA Cleared Claims for El Antioxidant Infused Technology
17. Ref. Smith & Nephew OR-07-176
18. Ref. Smith & Nephew OR-12-129