Persona®

THE PERSONALIZED KNEE®

Ti-Nidium® Knee

ZIMMER BIOMET

METAL HYPERSENSITIVITY in TOTAL JOINT REPLACEMENT

Metal hypersensitivity is an immunological reaction of the body against metallic particles (ions) that are released as a result of implant wear or corrosion. Metal hypersensitivity in patients undergoing joint replacement may lead to complications, as the reaction can induce an immune response, leading to inflammation and sometimes implant failure.[1]

The prevalence of cutaneous metal hypersensitivity in the general population is estimated to be between 10%–15%, while prevalence in patients with metallic implants may be as high as 25%.[2]

An Alternative for Patients with Metal Hypersensitivity

The Persona Ti-Nidium Knee

provides enhanced surface properties, with no deliberate addition of common metal sensitizers (Ni, Co, or Cr), offering an alternative for patients that present metal hypersensitivity. The Persona Ti-Nidium Knee leverages the proprietary Ti-Nidium Surface Hardening Process and Vivacit-E® Highly Crosslinked Polyethylene (HXLPE), delivering strong materials with demonstrated wear resistance.[3,4] Not only compatible with the precise and intuitive Persona Knee instrument platform and anatomic implants, it is also free from common metal sensitizers. The Persona Ti-Nidium Knee enables personalization for patients with metal hypersensitivity, regardless of ethnicity, gender, or stature.

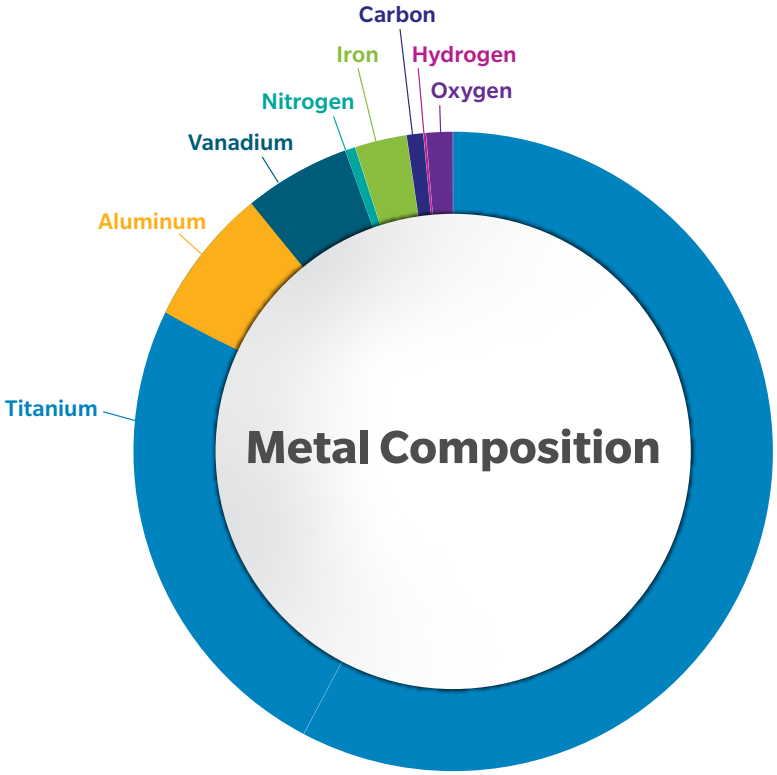
Strong Surface Properties
The Ti-Nidium Surface Hardening Process increases the implant's resistance to particle release, scratch and third body wear[3]

Strong Surface Properties

The Persona Ti-Nidium Knee leverages the same metal alloy as the NexGen LPS Flex Tivanium® Knee, which has over 13 years of clinical use. The Tivanium Ti-6Al-4V alloy is treated with the Ti-Nidium Surface Hardening Process, resulting in a strengthened material with demonstrated hardness and abrasion resistance.[3]

Combined Wear Resistance
The combination of the Persona Ti-Nidium Knee with Vivacit-E® HXPLE enhances the wear performance of the implant[3,4]

Personalized Care
Compatible with the precise and intuitive Persona Knee instrument platform and personalized anatomical implants[3,4]



The tivanium alloy used with the Persona Ti-Nidium Knee has no deliberate addition of common metal sensitizers

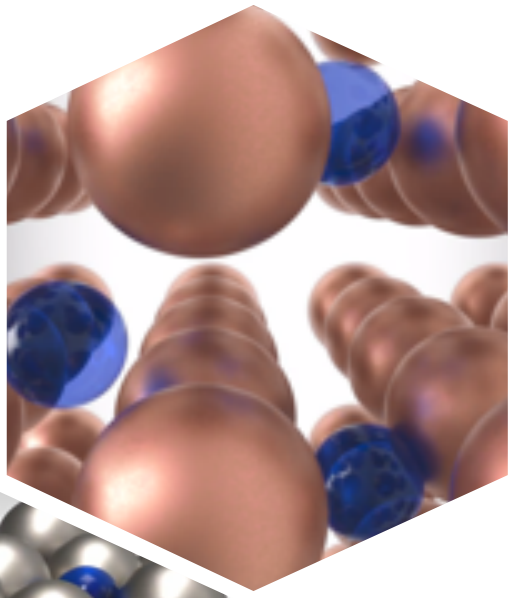
Figure 1
Persona Ti-Nidium Knee
Metal Composition

While titanium is a softer metal than cobalt chrome (Co-Cr-Mo), the Persona Ti-Nidium Femoral Components are strengthened through the Ti-Nidium Surface Hardening Process.

During the thermal nitriding process, nitrogen gas is diffused into the implant surface (Figure 2) and once cooled, creates a nitrogen-enriched zone in the surface of the prosthesis (Figure 3). As a result, the prosthesis' surface hardness and abrasion resistance are substantially increased while the potential for particulate release is substantially reduced.[3]

Note: Nitrogen gas is depicted as the blue particles

Figure 2



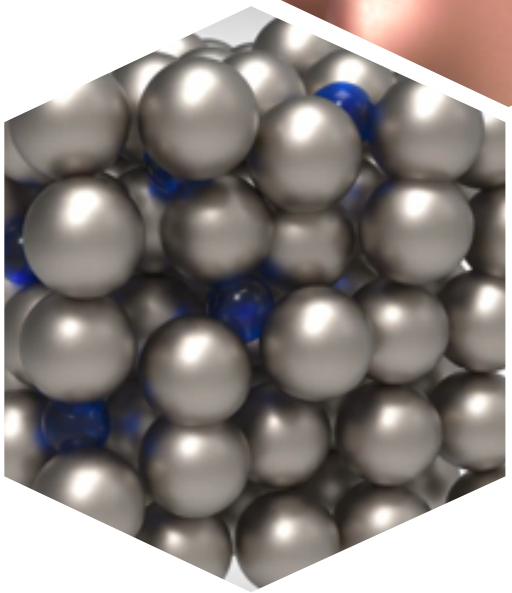


Figure 3

Combined Wear Resistance

The Persona Ti-Nidium Femoral Components are compatible with Vivacit-E HXLPE Bearings, with 96% wear reduction compared to conventional polyethylene (Figure 4).[4] The Persona Ti-Nidium Femoral Components also demonstrated a higher level of microhardness in an in vitro analysis comparing cobalt chrome (Co-Cr-Mo) and titanium components (Ti-4Al-6V), providing increased scratch resistance and third body wear (Figure 5).

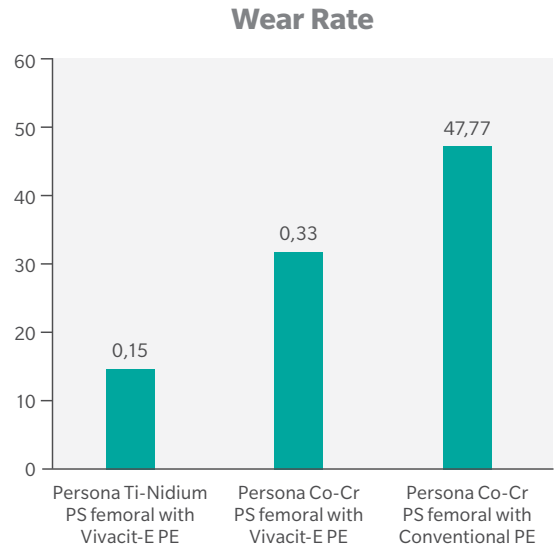


Figure 4

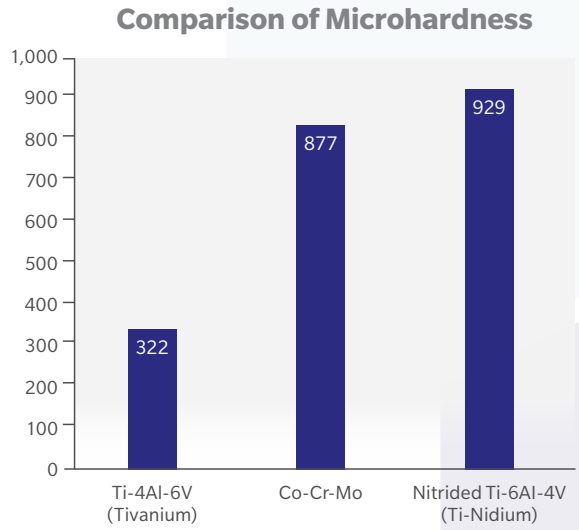


Figure 5

Personalized Care

The Persona Ti-Nidium Knee builds on the personalization of the Persona Knee platform by offering a metal alternative void of common sensitizers found in cobalt chrome femurs, accommodating a personalized fit with a streamlined workflow.

	Persona CoCr	Persona Ti-Nidium	Benefits
Material	CoCr, Cast	Ti-6Al-4V Alloy, Forged	Forged Persona Ti-Nidium Femoral Components , mechanical strength and no deliberate additions of Co, Cr, or Ni
Implant Aspect/Color	Gray	Dark Gray	Persona Ti-Nidium Femoral Components can be differentiated from CoCr components
Weight	0.1310 kg - 0.3933 kg (0.29 lb - 0.87 lb)	0.0681 kg - 0.2031 kg (0.15 lb - 0.45 lb)	Persona Tinidium Femoral Components are around 50% of the weight of CoCr Components
Sizing	Narrow:1-11 Standard: 1-12	Narrow:1-6 Standard: 4-12	Persona Ti-Nidium Implants include narrow sizes to optimize the patient fit
Implant Geometry	Same/Identical	Same/Identical	Expanded personalization and proven treatment options for metal sensitive patients, leveraging the comprehensive Persona Knee platform and streamlined surgical approach
Surgical Technique			

References

1. Granchi, D., et al. Metal hypersensitivity testing in patients undergoing joint replacement. *Journal of Bone and Joint Surgery.* Vol. 94-B, No. 8. 2012.
2. Metal hypersensitivity in total hip and knee arthroplasty: Current concepts Samuel Akila, Jared M. Newmana, Neil V. Shaha, Natasha Ahmedb, Ajit J. Deshmukhc, Aditya V. Maheshwaria. *Journal of Clinical Orthopaedics and Trauma*.
3. Improved Abrasion Resistance of Nitrogen-Hardened Titanium Alloy Surfaces. Current Topics in Orthopaedic Technology. Zimmer. Vol. 3, No. 6 (1991).
4. Zimmer ZRR_WA_2537_12

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Legal Manufacturer
Zimmer, Inc.
1800 West Center Street
Warsaw, Indiana 46580
USA

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zimmerbiomet.com