

MULTIGEN⁺

THE TOTAL KNEE SYSTEM

CERAMIC KNEE

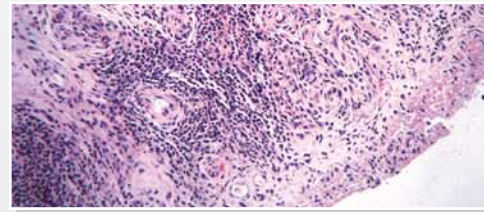
Metal sensitivity. A metal free solution with reduced wear.

Recent studies would suggest a baseline incidence of nickel sensitivity in the general population to be in the order of 10 to 15%. [1]

The frequency of positive skin reaction to metal increased significantly after TKA [2] and the prevalence of metal sensitivity among patients with a well-functioning implant is approximately 25%, roughly twice that of the general population. [3]

Hypersensitivity symptoms include severe dermatitis, urticaria and vasculitis, or any alone, often linked with the relatively more general phenomena of metallosis, excessive periprosthetic fibrosis, and muscular necrosis. [4]

10 to 15% of us are metal sensitive.



Histological analysis reveals diffuse lymphoplasmacytic infiltrations, often with extensive necrosis and/or fibrin deposition

A 60-year-old woman following TKA with a conventional cobalt-chrome femoral component. Metal sensitivity testing was positive for cobalt-chrome alloy and negative for titanium. Sepsis work-up, including aspiration of the joint, was negative. Range of motion was limited to 80° flexion with a 10° flexion contracture, with severe unremitting pain and swelling.

MULTIGEN⁺ Ceramic Knee provides you with a reduced wear, metal-free solution.

Recognizing that a solution was necessary for metal sensitive patients, Lima has developed the MULTIGEN⁺ Ceramic Knee. Manufactured from ceramic, one of the least reactive biomaterials, the MULTIGEN⁺ Ceramic Knee eliminates all hipersensitivity risks for the large community of metal sensitive patients.

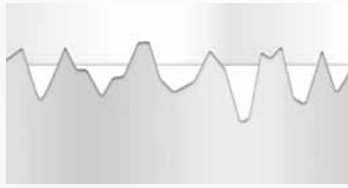
The MULTIGEN⁺ Ceramic Knee has been used since 2006 and more than 1000 implants have been made to date [5].



Ceramic



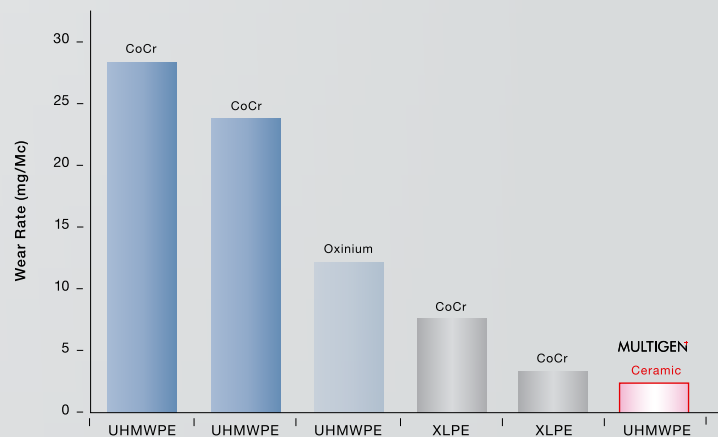
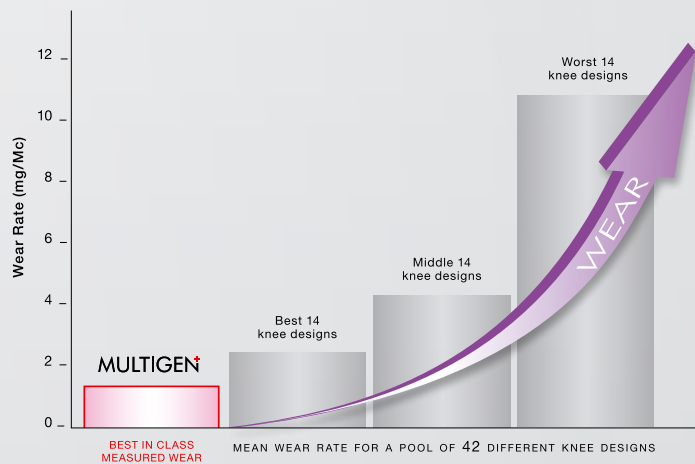
Metal



Smooth

The **MULTIGEN⁺** Ceramic Knee has a smooth surface designed to increase survivorship through reduced wear. The ceramic components receive precisely executed final polishing which results in reduced surface roughness (around 2 nanometers) of all implant materials. In case of scratching a ceramic knee surface shows just valleys, unlike a metal surface which shows peaks and valleys. This also contributes to reducing wear.

Wear and fatigue resistant



A test was performed [by an independent certified laboratory [6] (Endolab GmbH, Munich, Germany)] to determine the wear behaviour of the **MULTIGEN⁺** Ceramic Knee.

The results were compared to those of 42 knee systems tested with the same protocol. The **MULTIGEN⁺** Ceramic Knee shows improved wear characteristics over metal components.

The **MULTIGEN⁺** Ceramic Knee wear rate of $1.76 \pm 0,41$ mg/million cycles [6] is the lowest wear rate against polyethylene among those reported in the literature for CoCr and newer materials [7, 8, 9].

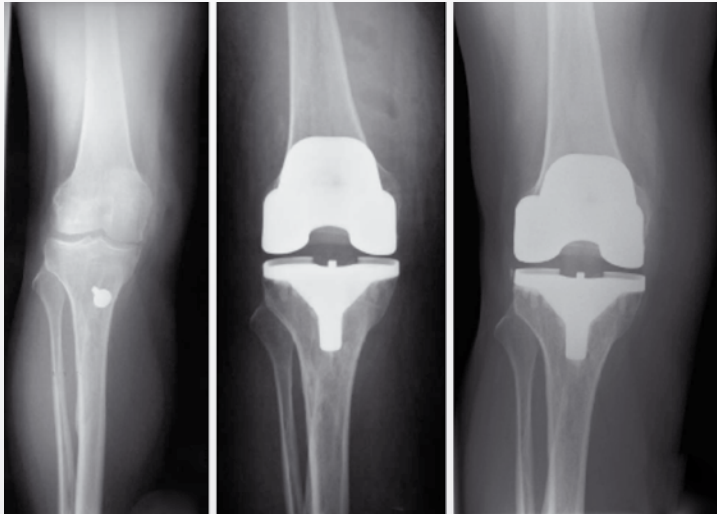
Lima **MULTIGEN⁺** Ceramic Knee was successfully tested for fatigue resistance at 3KN per 20 M cycles.

Post fatigue burst tests were also performed with an average ultimate load of 8320N, much higher than the required 5 KN. [10]

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Courtesy of Prof. W. Mittelmeier, Rostock, Germany



PRE-OP

POST-OP

24 MONTHS

Clinical Case Study

Preoperative

48-year-old female (1.55 m, 64 kg, BMI 26.6) with an active lifestyle and proven metal sensitivity to nickel and chrome. Symptomatic osteoarthritis of the right knee (previous tuberositas tibiae osteotomy) with 2° varus deformity. Severe walking and at-rest pain, poor range of motion with significant activity limitations.

Treatment

Primary TKA through parapatellar approach (under CSE anaesthesia, single-shot cefuroxime prophylaxis) with implantation of **MULTIGEN⁺** ceramic femoral component (#2), Ti6Al4V fixed tibial plate (#2) and 10 mm polyethylene liner. Good bone quality and no intraoperative complications.

Postoperative

X-ray shows a good implant alignment with 97.5° AP femoral flexion angle, 90° AP tibial angle and 187° total angle, 1.5° lateral flexion angle and 87° lateral tibial angle.

24-month Follow-Up

X-ray shows implant with good stability, no radiolucent lines both in the femoral and tibial component, no residual pain with a good functional recovery, 120° ROM, no flexion contracture, < 5° extension lag.

Bibliography

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