Implant Science Research

The mechanisms involved in early implant failure are multifactorial, involving surgeon, implant and patient (SIP) factors. Our key papers that separate out these SIP factors are presented below. Please click on the links to view the abstracts. Those papers that are “Gold Open Access” can be downloaded in full without requiring a journal subscription.

**Surgeon Factor Papers:**

- Component Size Mismatch of Metal on Metal Hip Arthroplasty: An Avoidable Never Event (2014)
- Clinical Usefulness of SPECT–CT in Patients with an Unexplained Pain in Metal on Metal (MOM) Total Hip Arthroplasty (2015)
- 2D measurements of cup orientation are less reliable than 3D measurements (2015)
- International metal-on-metal multidisciplinary teams: do we manage patients with metal-on-metal hip arthroplasty in the same way? An analysis from the International Specialist Centre Collaboration on MOM Hips (ISCCoMH) (2016)
- Management of metal-on-metal hip implant patients: Who, when and how to revise? (2016)
- The effect of using components from different manufacturers on the rate of wear and corrosion of the head-stem taper junction of metal-on-metal hip arthroplasties (2016)
- The Effect Of Impact Assembly On The Interface Deformation And Fretting Corrosion Of Modular Hip Tapers: An In Vitro Study (2018)
- 3D patient imaging and retrieval analysis help understand the clinical importance of rotation in knee replacements (2018)
- Computed Tomography Techniques Help Understand Wear Patterns in Retrieved Total Knee Replacement (2018)
- Cup Inclination Angle of Greater than 50 Degrees Increases whole Blood Concentrations of Cobalt and Chromium ions after Metal-on-metal Hip Resurfacing (2008)
The relationship between the angle of version and rate of wear of retrieved metal-on-metal resurfacing hips. A PROSPECTIVE, CT-BASED STUDY (2011)

Insufficient Acetabular Version Increases Blood Metal Ion Levels after Metal-on-metal Hip Resurfacing (2011)

Understanding why metal-on-metal hip arthroplasties fail: A comparison between patients with well-functioning and revised Birmingham hip resurfacing arthroplasties - AAOS exhibit selection (2012)

Which Factors Determine the Wear Rate of Large-Diameter Metal-on-Metal Hip Replacements? (2013)

**Implant Factor Papers:**

Retrieval Findings of Recalled Dual-Taper Hips (2018)

Effect of Bearing Type on Taper Material Loss in Hips From 1 Manufacturer (2018)

Assessment of corrosion in retrieved spine implants (2018)

Assessment of the equivalence of a generic to a branded femoral stem (2017)

Analysing a mechanism of failure in magnetically controlled spinal rods (2017)

Fretting and Corrosion Between a Metal Shell and Metal Liner May Explain the High Rate of Failure of R3 Modular Metal-on-Metal Hips (2017)

The variation in taper surface roughness for a single design effects the wear rate in total hip arthroplasty (2017)

Clinical Cold-Welding of the Modular Total Hip Arthroplasty Prosthesis (2017)

Factors Associated With Trunnionosis in the Metal-on-Metal Pinnacle Hip (2017)

Clinical significance of corrosion of cemented femoral stems in metal-on-metal hips: a retrieval study (2016)

Lessons from retrievals: Retrievals help understand the reason for revision of coated hip arthroplasties (2015)

Corrosion of Metal Modular Cup Liners (2015)

Influence of stem type on material loss at the metal-on-metal pinnacle taper junction (2015)

Enhanced Wear and Corrosion in Modular Tapers in Total Hip Replacement Is Associated With the Contact Area and Surface Topography (2013)

Material Loss at the Taper Junction of Retrieved Large Head Metal-on-Metal Total Hip Replacements (2013)

A retrieval analysis of explanted Durom metal-on-metal hip arthroplasties (2011)

A comparison of explanted Articular Surface Replacement and Birmingham Hip Resurfacing components (2011)

**Patient Factor Papers:**
Pseudotumors Are Common in Well-positioned Low-wearing Metal-on-Metal Hips (2012)

Pseudotumors in Association with Well-Functioning Metal-on-Metal Hip Prostheses A Case-Control Study Using Three-Dimensional Computed Tomography and Magnetic Resonance Imaging (2012)

Muscle atrophy and metal-on-metal hip implants: A serial MRI study of 74 hips (2015)

Frequent Femoral Neck Osteolysis With Birmingham Mid-head Resection Resurfacing Arthroplasty in Young Patients (2015)

Clinical relevance of corrosion patterns attributed to inflammatory cell-induced corrosion: A retrieval study (2017)

Understanding the in vivo reactivity of metal orthopaedic implants (2016)

The Chemical Form of Metal Species Released from Corroded Taper Junctions of Hip Implants: Synchrotron Analysis of Patient Tissue (2017)

Assessing for Cardiotoxicity from Metal-on-Metal Hip Implants with Advanced Multimodality Imaging Techniques (2017)

Decrease in Local Volumetric Bone Mineral Density in Osteoarthritic Joints Is Associated with the Increase in Cartilage Damage: A Peripheral Quantitative CT Study (2017)

Synchrotron Analysis of Human Organ Tissue Exposed to Implant Material (2018)

The risk of cardiac failure following metal-on-metal hip arthroplasty (2018)

Understanding the reactivity of CoCrMo-implant wear particles (2018, Gold Open Access)