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Accurate determination of clinical wear in retrieved metal-on-metal hip replacement joints

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#### ABSTRACT

The 2011 edition of the England and Wales National Joint Registry shows an increased failure rate for resurfacing and Large Head Metal-on-Metal (LHMoM) hips compared to other designs. The recent recall of the DePuy ASR has only increased the worldwide interest in the assessment of wear of explanted hip joints. The failure of these components has been linked to increased wear rates. Measuring the wear of explanted components allows a direct insight into the in-vivo behaviour of the implants. Wear analysis is a vital tool in determining failure mechanisms and ultimately improving the longevity of joint replacements through improved design and manufacturing control. To achieve this methods have been developed to accurately quantify *in vivo* total joint replacement wear from retrieved total hip replacement components.

In this study a CMM and a roundness machine were used to develop traceable measurement methods to determine the overall contribution to wear of each component interface. A number of retrieved hip replacement bearings were supplied and both bearing surfaces and taper junction were analysed. The results are discussed and are analysed in light of possible implications regarding component failure mode.

Keywords: implants, Co-ordinate Measurement, Roundness Measurement, Wear.

Topic: Tissue Engineering & Biomaterials: Wear of implants