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" 'Nickel Free' Hypoallergenic versus Standard Cobalt-Chrome Containing Total Knee Replacement: Is There a Difference in Synovial Metal Ions at Minimum 1-Year Follow-up? "

Nearly 1 million total knee replacements (TKA) are performed in North America for arthritis every year and this number is increasing. Unfortunately, up to 20% of patients are not satisfied with the results of their TKA. Metal allergy has been proposed as a possible cause of dissatisfaction and failure in some TKA patients. Furthermore, we know that some metal ions released from the implants in hip replacements can cause a bad reaction with the joint tissue and lead to failure of the joint replacement. Recent studies have also identified this adverse reaction to metal ions (distinct from metal allergy or hypersensitivity) as a potential source of failure in TKA.

In response to this, certain companies that make TKA implants have developed special coated or "hypoallergenic implants" that don't contain the main metal ions responsible for metal allergy/hypersensitivity reaction (mainly cobalt, chromium, and nickel), or adverse local tissue reaction to metal debris. The use and need of these implants are of considerable debate. Some studies have looked at the metal ion levels in the blood of patients with the special "hypoallergenic" implants versus those with standard TKA implants, but no study has looked at metal ion levels in the knee joint fluid 1-2 years after surgery.

The differences in knee joint fluid of metal ions months to years out from a knee replacement between these groups remains completely unknown. This is crucial information to know because it is the local knee joint fluid an environment (not blood ion levels) that would be responsible for allergic/hypersentitivy reactions, as well as adverse reactions to metal debris.

Our study looks to compare the level of these metal ions in the knee joint fluid of patients who had hypoallergenic implants versus those who had standard TKA implants at a minimum of 2 years after surgery. We will also compare functional outcomes between these two groups. The results from our study have the potential to impact outcomes for all knee replacement patients with metal allergy and those failing from adverse reactions in the joint to metal debris.