NJR Analysis of Collared and Collarless Total Hip Replacement using the cementless CORAIL® Femoral Stem

National Joint Registries provide valuable information on the revision rates and survivorship of orthopaedic implants. Typically they include large cohorts with data from all surgeons and from all centres, irrespective of surgeon experience level. The National Joint Registry for England, Wales, Northern Ireland and the Isle of Man (NJR) has been in operation since 2003 and in that time has collected data on over 1,000,000 primary total hip replacements (THR).¹

The NJR has produced a new set of analyses examining the performance of the CORAIL Femoral Stem in combination with the PINNACLE® Cup. This analysis was commissioned by DePuy Synthes, but conducted and validated by the NJR. Metal liners have been excluded from all analysis. The first report details 150,465 CORAIL Stem and PINNACLE Cup implantations (mean age 65.8, 43.7% male).² In order to better understand the performance of the CORAIL Stem and PINNACLE Cup Construct, the report compares the CORAIL Stem and PINNACLE Cup to all other cementless hips on the NJR (n=402,309). It was found that the CORAIL Stem and PINNACLE Cup presents a 14% reduced risk of revision when compared to all other cementless hips on the NJR (All-cause revision, adjusted HR 0.86 (0.82, 0.90) p<0.001)²

The CORAIL® Femoral Stem is available both with and without a medial collar. Proponents of the use of a collared prosthesis claim that it provides advantages in the early stability of the implant, allowing for earlier post-operative weight bearing, protection against subsidence, and a positive dispersion of the vertical forces via the collar into the medial calcar.³⁻⁴ Recently published data has demonstrated that collared cementless implants significantly reduce the risk of revision due to peri-prosthetic fracture.⁵⁻⁶

Further reports have examined the performance of the CORAIL Stem in combination with the PINNACLE Cup.⁷⁻⁸ The reports detail 81,685 CORAIL Collared Stems with PINNACLE Cup implantations (mean age 66.7, 40.3% male) with survivorship that extends to 13 years. The cumulative revision rate (CRR) at 10 years is 2.6% (2.4, 2.6%) and at 13 years is 4.0% (3.2, 5.2%). This cohort is compared all other cementless hips on the NJR. This includes 402,309 implantations; the 10-year CRR 3.7% (3.6, 3.8%) and the 13-year CRR is 5.0% (4.9, 5.2%). The chart below presents the CRR and the reports provide hazard ratios to compare the relative risk of revision. The hazard ratio presented below is adjusted for differences in age, gender, diagnosis and year of implantation.

The reports provide a cohort of 68,780 CORAIL Collarless Stems with the PINNACLE Cup (mean age 64.6, 47.9% male). This group shows no difference in risk of revision when compared to all other cementless hips on the NJR (HR 1.03 (0.98, 1.08) P=0.274).² All reports can be accessed at http://www.corailpinnacle.net/supporting-evidence/overview

CORAIL Collared Stem with the PINNACLE Cup

28% less likely
to be revised when compared to all other cementless hips on the NJR.
HR adjusted 0.72 (0.68, 0.77) P<0.001
In addition to survival analysis the NJR reports also examine the reasons for revision. The reports provide the actual number of revisions reported for each reason within the CORAIL Collared Stem and PINNACLE Cup cohort, as well as the number that would be expected for a cohort of 81,685, based on the data for all other cementless hips on the NJR. These numbers are then compared. CORAIL Collared Stem with the PINNACLE Cup demonstrates statistically significantly fewer revisions than all other cementless hips across a range of revision reasons. This includes peri-prosthetic stem fracture (245 expected vs 76 actual (p<0.001)), pain (140 expected vs 102 actual (p<0.006)), infection (246 expected vs 208 actual (p=0.006)), and dislocation (314 expected vs 258 actual (p<0.001)).

CORAIL Collared Stem with the PINNACLE Cup

Significantly fewer than expected revisions
due to Pain, Dislocation, and Peri-Prosthetic Fracture (all p<0.001)

References