

# The CORAIL® femoral stem is forgiving, with favourable radiologically-determined fixation and generally good/excellent or improved clinical and patient-reported outcomes after total hip arthroplasty

## Introduction

A total of 29 studies reporting on clinical, radiological or patient-reported outcomes for the CORAIL stem were identified in a systematic review (SR); representing 4,200 hips. Results are summarised for clinical (survivorship, Harris Hip Score [HHS]), radiological (stem subsidence), and patient-reported outcomes (Oxford Hip Score [OHS], Western Ontario and McMaster Universities Arthritis Index score [WOMAC]).

Follow-up periods were grouped into short- (0-4 years), medium- (5-10 years) and long-term (>10 years).

## Results – clinical outcomes

### Survivorship

Seven studies reported survivorship with end point revision for any cause. Three studies reported survivorship >99.0%, each considering a different time point: three year survivorship of 99.5%<sup>1</sup>, eight year survivorship of 99.0%<sup>2</sup>, and 12 year survivorship of 99.1%<sup>3</sup>. A further two studies reported survivorship >96.0%: 12 year survivorship of 96.8%<sup>4</sup> and 15 year survivorship of 97.6%<sup>5</sup>. In the remaining two studies, eight year survivorship of 93.3%<sup>6</sup> and survivorship <90% at 15, 18, 20 and 23 years<sup>7</sup> were reported. However, in both studies<sup>6,7</sup>, when the end point of stem only revision was assessed, survivorship >96% was reported, indicating low revision rates of the CORAIL stem.

### Harris Hip Score (HHS)

Postoperative HHS outcomes were reported across a total of 636 hips from six studies<sup>4,7-11</sup>. The mean HHS was rated as good (HHS 80-89) in three short-term studies, and good/ excellent (HHS>80) in three long-term studies.

## Results – radiological outcome

### Stem subsidence

Stem subsidence was reported in either a) number of patients (four studies) or b) number of hips (six studies). The number of patients experiencing clinically significant subsidence of >3 mm was 33/325 (10.0%) across three short-term studies<sup>12-14</sup> and 1/347 (0.3%) in one long-term study<sup>15</sup>. Across three short-term studies, 23/451 (5.1%) hips had clinically significant subsidence<sup>16-18</sup>. Clinically significant subsidence

was frequently confined to the first six months postoperatively, which may indicate stabilisation due to osseointegration. In the remaining studies (two medium-term and one long-term), no hips had clinically significant subsidence<sup>19-21</sup>.

## Results – patient-reported outcomes

### Oxford Hip Score (OHS)

Six short-term studies, representing a total of 1,576 hips, reported on the OHS. Postoperative OHS ratings were described as excellent (OHS>41) in three studies<sup>1,2,21</sup>, good (OHS 34-41) in one study<sup>9</sup>, and fair (OHS 27-33) in two studies<sup>22,23</sup>. The two studies reporting fair OHS may be considered unrepresentative. In the first study, only patients with a greater trochanteric fracture after THA were assessed<sup>22</sup> and therefore results may not be generalisable to the overall THA population. Although the OHS may improve out to six months postoperatively the second study used a follow-up time (six weeks) which may not capture the expected OHS improvements<sup>23</sup>.

### Western Ontario and McMaster Universities Arthritis Index Score (WOMAC)

The mean WOMAC score was reported in one short-<sup>21</sup>, three medium-<sup>23-25</sup> and one long-term study<sup>11</sup>; representing 1,012 hips. Due to variations in WOMAC score reporting, direct comparisons between studies were not possible. However, across all five studies an improvement in the mean WOMAC score was reported postoperatively<sup>11,21,23-25</sup>.

## Conclusion

The peer-reviewed articles summarised here demonstrate survivorship consistent with 2014 National Institute for Health and Care Excellence (NICE) guidance ( $\geq 95\%$  survivorship at ten years)<sup>26</sup>. CORAIL registry data representing 113,751 hips also reports survivorship of >95% after 10 years. Concordant survivorship results between peer-reviewed and registry data suggest that the CORAIL stem is a forgiving system, tolerant of different levels of surgical experience, varying patient selection and regions. The CORAIL stem is associated with generally good/excellent or improved clinical and patient-reported outcomes, with favourable radiologically-determined fixation.

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## Outcome grades

### Oxford Hip Score<sup>26</sup>

>41: Excellent  
34-41: Good  
27-33: Fair  
<27: Poor

### Harris Hip Score<sup>27</sup>

90-100: Excellent  
80-89: Good  
70-79: Fair  
<70: Poor

### WOMAC score

Due to variations in the questionnaire used in the included publications, please refer to the individual publications.



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CA#DSEM/JRC/0814/0120 Issued: 01/15