

1 **Supplementary data**

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3 **Supplementary Table 1. Precision of radiostereometric analysis**

Migration (n = 48)	Difference	Range	SD	Limit of agreement (+/-)
X-translation	0.01	-0.12 to 0.15	0.05	0.10
Y-translation	0.00	-0.16 to 0.31	0.09	0.18
Z-translation	0.00	-0.28 to 0.33	0.12	0.24
X-rotation	0.03	-0.85 to 0.77	0.26	0.51
Y-rotation	0.04	-1.16 to 0.92	0.40	0.78
Z-rotation	-0.02	-0.27 to 0.18	0.09	0.18
Total translation ^a	-0.02	-0.35 to 0.15	0.09	0.18
Total rotation ^b	0.01	-0.81 to 0.86	0.32	0.63
Maximum total point motion ^c	-0.03	-0.82 to 0.47	0.24	0.47

4 The precision of stem migration measurements was measured as the mean difference (SD) between the 2
5 recordings and reported with a min and max for all migration parameters [20].

6 ^aTotal translation denotes the combined translation resulting from the translation in each axis:

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$$\text{Total translation} = \sqrt{x\text{-translation}^2 + y\text{-translation}^2 + z\text{-translation}^2}$$

8 ^bTotal rotation denotes the combined translation resulting from the translation in each axis:

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$$\text{Total rotation} = \sqrt{x\text{-rotation}^2 + y\text{-rotation}^2 + z\text{-rotation}^2}$$

10 ^cMaximum total point motion denotes the largest translation of a point of the implant resulting from the
11 rotation and translation in combination.

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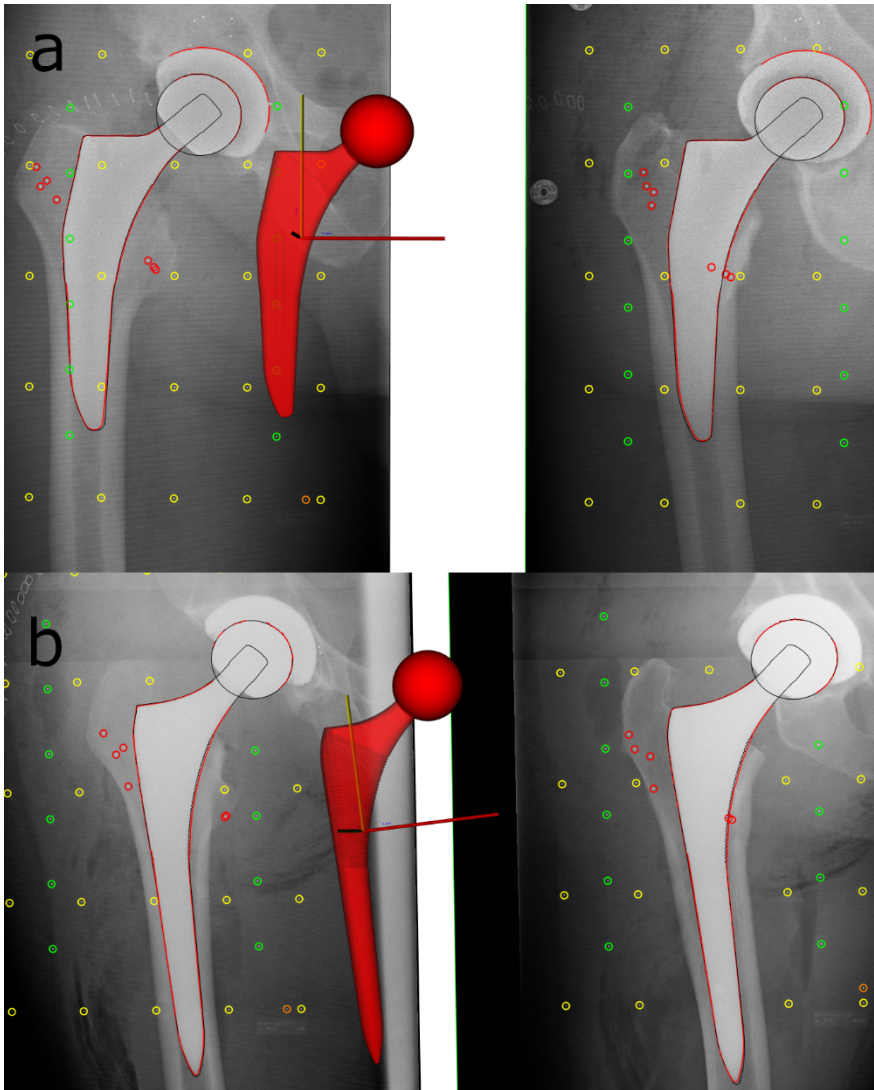
16 **Supplementary Table 2. Precision of dual energy x-ray absorptiometry**

Zone	Mean BMD (g/cm ²)	SD	Range	%CV
1	0.92	0.02	0.45 to 1.34	2.20
2	2.06	0.03	1.57 to 2.86	1.56
3	2.31	0.02	1.66 to 3.06	1.05
4	2.16	0.02	1.48 to 2.71	0.75
5	2.28	0.03	1.74 to 2.74	1.31
6	1.71	0.03	0.97 to 2.36	1.82
7	1.28	0.05	0.91 to 1.74	3.79

17 Precision of periprosthetic BMD measurements was calculated using the root-mean-square approach and
18 presented as % coefficient of variation (CV) [35].

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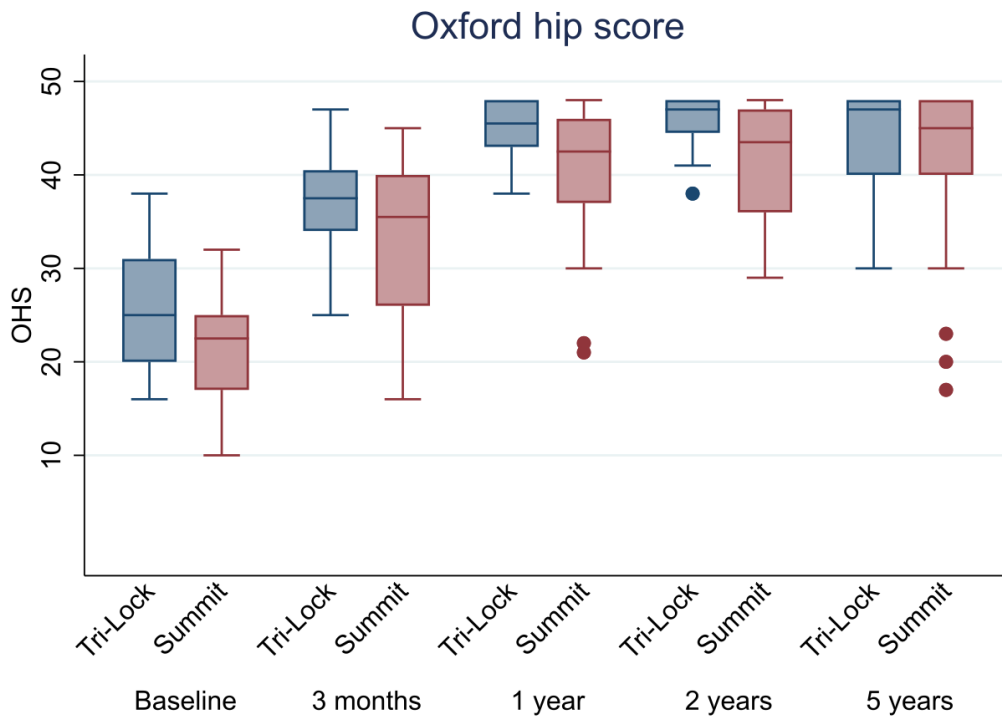


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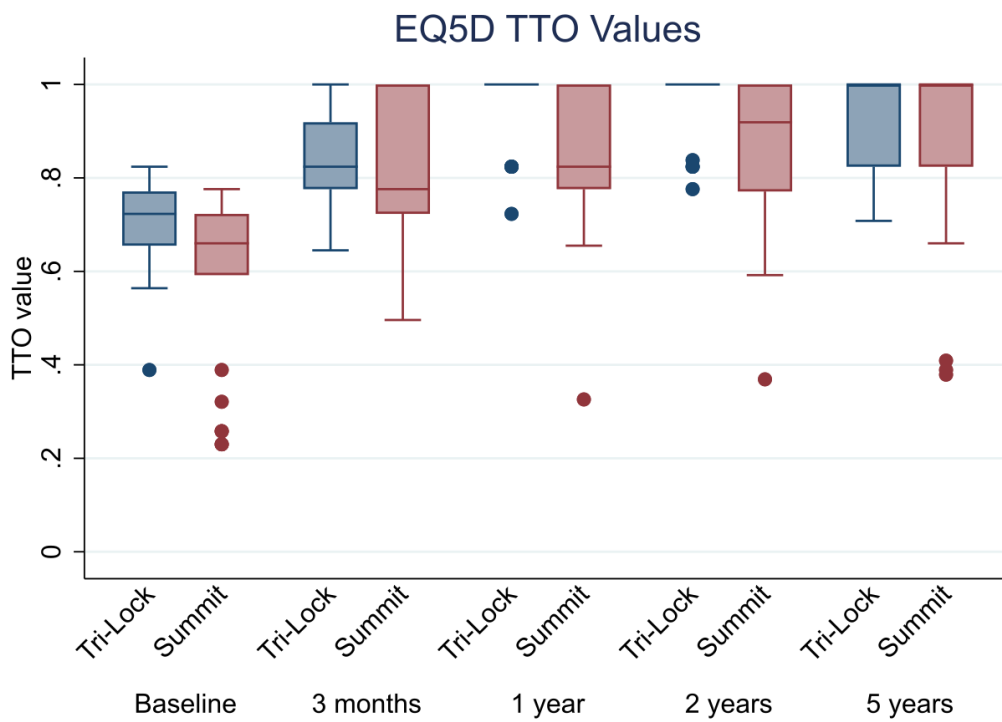
22 Supplementary Figure 1. Coordinate systems of the Tri-Lock (a) and Summit (b) stems showing the
23 x- (red), y- (yellow) and z-axis (green) of the model in the RSA analysis.

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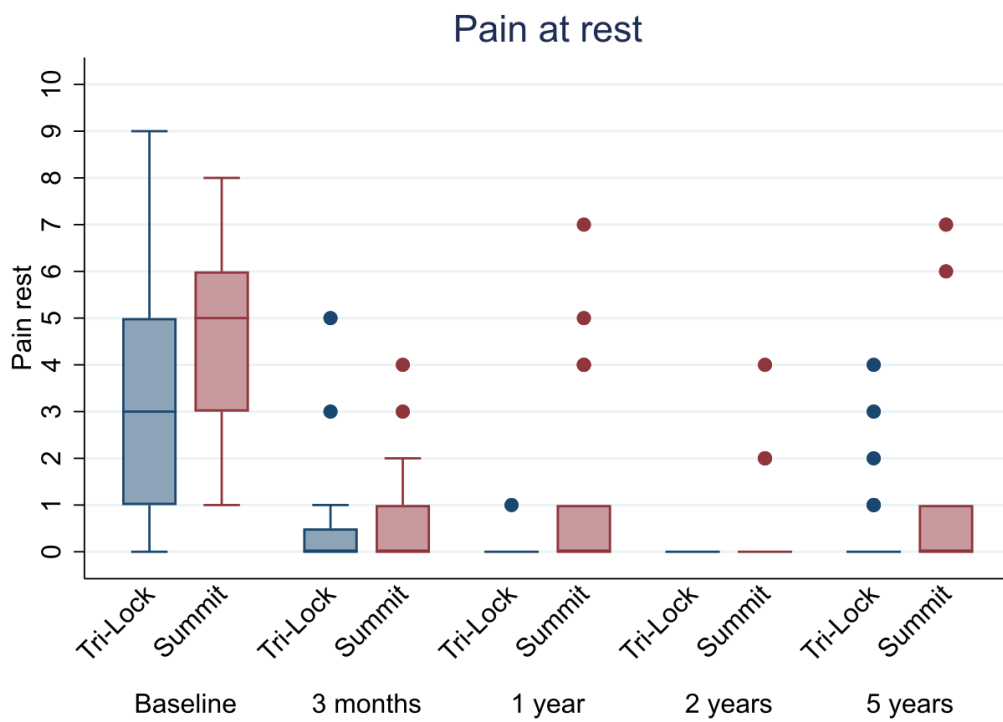
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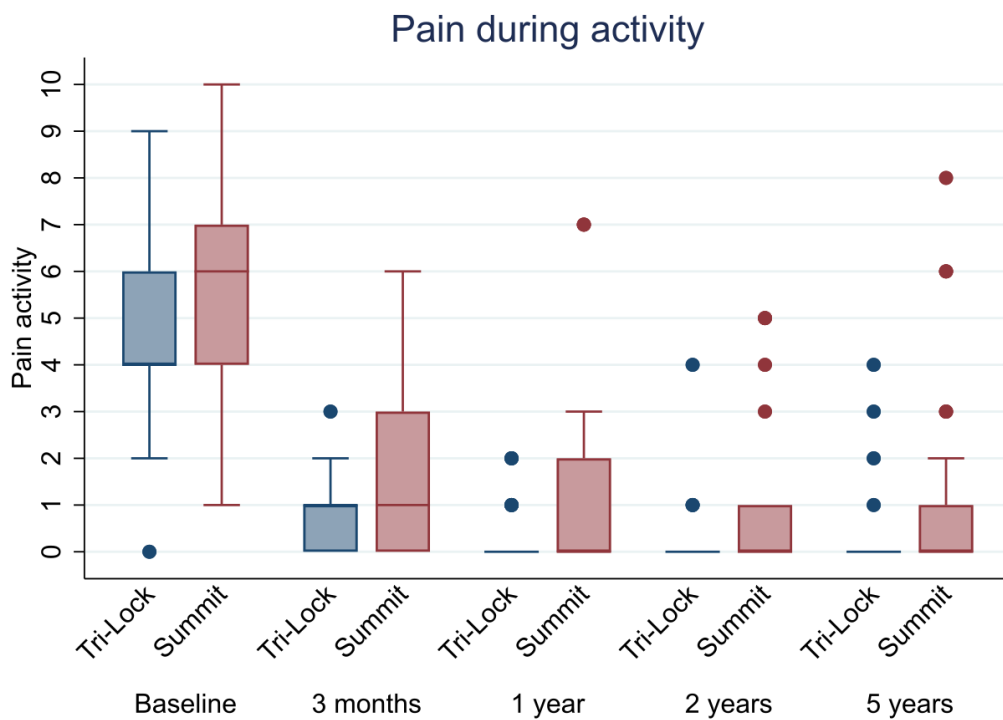
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28 Supplementary Figure 2. Oxford Hip Score and EuroQual5D.

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32 Supplementary Figure 3. Pain at rest and during activity.

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