

Re: WHITE4 paper, Griffin XL et al. BJJ Feb 2021

The trial compared X-Bolt XHS versus the Sliding Hip Screw (SHS). The implants differed only by the nature of femoral head fixation: an expanding bolt or traditional lag screw. 1,128 patients were randomized, with expected equal division between groups, 564 vs 564, but numbers actually receiving XHS vs SHS (implant vs implant) totalled 476 vs 582.

A randomization process usually generates groups broadly matched for baseline confounding variables, for example: age, gender, or pre-injury functional score. Statisticians can perform adjustments to the final results to take account of unevenness in these baseline factors.

Patients randomized to XHS had a lower baseline/pre-injury EQ5D, as a consequence of being more frail, with a median score of 0.670 versus a median score of 0.690 for SHS. However, Table 1 of the published paper reported the baseline score as being equal: 0.7 vs 0.7. This was rounded up from a more precise figure in Table 1 of the paper's proof manuscript of December 2020 (0.67 vs 0.69). The difference in median baseline EQ5D between the groups (0.020 lower in the XHS group) could have significantly impacted post-operative scores.

The main paper did not report the more frail baseline within the XHS group, nor did it report headline results adjusting for baseline EQ5D. That analysis was performed but is buried within the Supplemental Material. It shows a mean difference at 4-months post-operatively favouring XHS of +0.031 (95%CI - 0.007 to +0.069).

The XHS-group, as reported, includes 13% (56/437) 'crossover' patients, who were randomized to XHS, but received a SHS. All outcome scores in the main paper, as well as 'Adjusted for Baseline EQ5D' in the Supplementary Material, include these 13% 'crossover' SHS patients as part of the XHS group.

The mean EQ5D score for the 'crossover' SHS patients is 0.311 in 56 patients, which is considerably lower than the mean of 0.350 in 381 patients who actually received XHS ('Per Protocol').

A comparison of all patients receiving XHS versus all receiving SHS ('As Treated') and adjusting for baseline EQ5D was not performed/reported. However, calculating from the available data, shows an estimated mean difference 'As Treated' favouring XHS of +0.037 (95%CI -0.001 to +0.075).

Are these superior outcome scores at a level perceptible to patients, i.e. clinically significant? A recent metaanalysis paper² from 2019, validates a Minimally Important Difference (MID) for perception of a clinical benefit at mean +0.030 (95%CI +0.029 to +0.031). Using this as a benchmark, the majority of patients would perceive a clinical benefit with XHS.

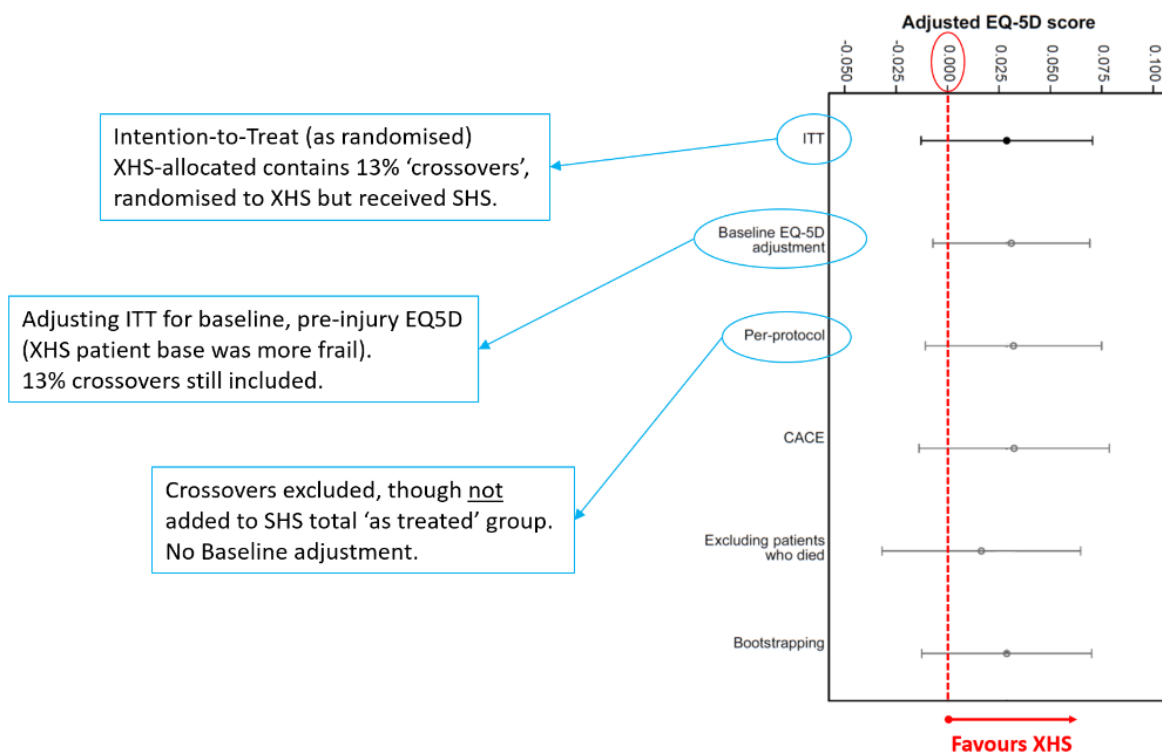
Clinical importance in the WHITE4 paper references 2005 paper³ with a Minimally Important Difference (MID) of mean 0.074, though with wide confidence intervals (95%CI -0.011 to 0.140). Using this as a benchmark, 25% of patients would perceive a clinically important difference with XHS.

The primary outcome measure was an EQ5D score at 4-months. XHS may have shown greater favourability, earlier in the post-operative period (0-4 months), given that stronger fixation would likely influence early stability and weight-bearing. The pragmatic nature of the trial methodology did not allow for this, with 4-months being the earliest time point for recording outcome score.

The high volume of hip fractures affects a frail and elderly population, whose main desire is to stay out of hospital and maintain their independence. All efforts should strive to provide better outcomes for these patients.

In summary:

1. The paper presents as randomized (564 vs 564), not implant vs implant 'as treated' (476 vs 582)
2. XHS group had a lower (more frail) median baseline EQ5D (0.67 vs 0.69)
3. The published paper rounded-up baseline EQ5D to 0.7 vs 0.7
4. No 'Adjustment for Baseline EQ5D' in main analysis
5. 'As Treated' strongly favours XHS: Mean +0.037 (95%CI -0.001 to +0.075)
6. XHS benefit is perceptible to at least 25% patients
7. XHS may have shown greater favourability, earlier in the post-operative period (0-4 months), given that stronger fixation would likely influence early stability and weight-bearing



References

1. Griffin XL, Achten J, O'Connor HM, Cook JA, Costa ML, WHiTE Four Investigators. Effect on health-related quality of life of the X-Bolt dynamic plating system versus the sliding hip screw for the fixation of trochanteric fractures of the hip in adults: the WHiTE Four randomized clinical trial. *The Bone & Joint Journal*. 2021 Jan 4;103:1-8.
2. Harvie HS, Honeycutt AA, et al. Responsiveness and minimally important difference of SF-6D and EQ-5D utility scores for the treatment of pelvic organ prolapse. *Am J Obstet Gynecol*. 2019 Mar; 220(3): 265.e1–265.e11.
3. Walters SJ, Brazier JE. Comparison of the minimally important difference for two health state utility measures: EQ-5D and SF-6D. *Qual Life Res*. 2005;14(6):1523–1532.