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eLetter in response to: Redefining the 3D Topography of the Acetabular Safe Zone: A Multivariable Study Evaluating Prosthetic Hip Stability

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Dear Editor,

I read with great interest the article by Hevesi et al. (1), which sought to redefine the ‘safe zone’ of cup orientation first proposed by Lewinnek et al. (2) in 1978.

To measure cup anteversion, Hevesi et al. used the method described by Woo and Morrey (3) on cross-table radiographs. This method is different to that used by Lewinnek et al. (2), who measured Radiographic Anteversion (4), referenced to the Anterior Pelvic Plane on supine anteroposterior radiographs. This dissimilar comparison is not uncommon. A study of hundreds of articles referencing Lewinnek’s safe zone concluded that only 11% reference it correctly (5). Further, investigations by Park et al. (6) and Nho et al. (7) found that Woo and Morrey’s method tends to measure anteversion at about 10° larger than Lewinnek’s method. Considering this, Hevesi et al.’s (1) newly defined ‘safe zone’ for anteversion of 28° ± 10° may not differ significantly from Lewinnek’s of 15° ± 10°.

Additionally, a significant issue with Lewinnek’s safe zone was that future studies (8, 9) observed significant numbers of dislocations within the safe zone, rendering it not so safe after all. The source of this inability to define a generic safe zone from supine radiographs is likely two-fold. First, measurements of cup orientation taken on supine radiographs do not reflect the cup orientation when dislocation is most likely to occur; in functional positions. Second, the high variability of pelvic motion through the sagittal plane between functional positions (10) leads some patients to dislocate, while others with the same cup orientation do not. Therefore, it is likely there will always be some patients who dislocate within a ‘safe zone’, and these patients would likely benefit from functional analysis to optimize cup orientation.

In sum, the motivation of this letter is not to reinforce the status quo of Lewinnek’s safe zone. Quite the opposite. It is to draw attention to the need for specificity and consistency of measurements, and to highlight the need for functional planning, not safe zones, in hip arthroplasty.

References

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Conflict of Interest:

I am a paid employee of 360 Med Care, which is an Australian-based orthopedics company specialising in patient-specific planning for hip and knee arthroplasty.