

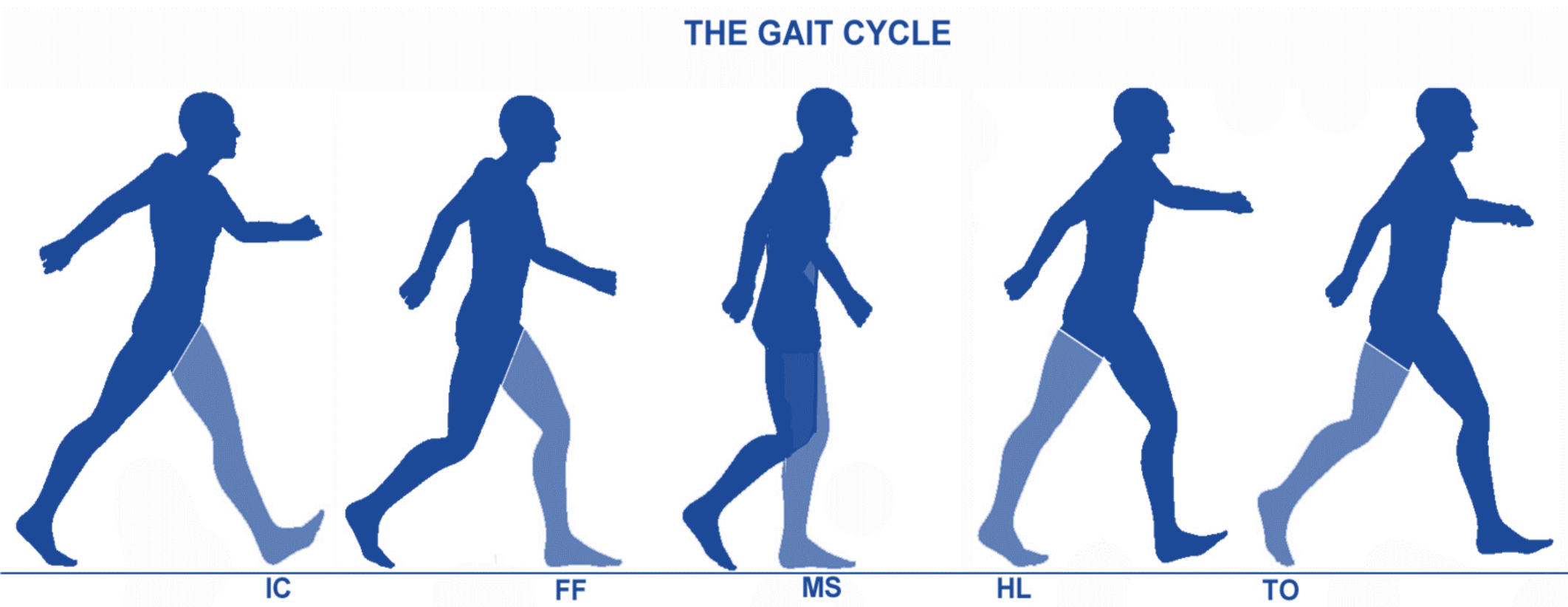
# IMPROVEMENT IN GAIT ABNORMALITY FOLLOWING MINIMALLY INVASIVE POSTERIOR APPROACH SACROILIAC JOINT FUSION

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## Introduction

- Sacroiliac joint dysfunction and pain is being more recognized as a source of low back pain, estimated to be responsible for 15-30% of non-radicular low back pain(1).
- The sacroiliac joint (SIJ) is diarthrodial joint that plays an important role in maintenance of a normal gait. In bipedal gait, the SIJ are the ‘hub’ of forces transferred from the trunk to the ground and vice versa(2).
- Individuals with SIJ dysfunction exhibit both reduced activation of gluteus maximus during a loading synergy present in walking and greater asymmetry between legs when walking compared with age-matched controls(3).
- Gait abnormality may contribute to additional comorbid conditions and pain.
- In this prospective, single-arm longitudinal multicenter clinical study we assessed gait impairment in patients with SIJ dysfunction and analyzed the improvement in gait dysfunction following minimally invasive posterior SIJ fusion.
- Though studies detailing device efficacy and long-term relief are being published, there is no current study detailing the improvement on gait abnormality with dynamic non patient reported data following posterior SIJ fusion.



## Materials/Methods

- IRB approval for this study was secured and patient consent has been received.
- After screening for appropriateness for posterior SIJ fusion, if th
- e patient met inclusion/exclusion criteria they were provided with informed consent to participate in the study.
- We then conducted a prospective non-patient reported analysis of all patients who underwent a posterior SIJ fusion procedure at 2 private interventional pain practices.
- A portable kinesis gait assessment tool was attached to the patients for gait assessment at baseline, one month, and 6 months post-operatively.
- Gait assessment data that was collected included gait velocity, impairment in speed, symmetry, variability, and fall risk assessment.

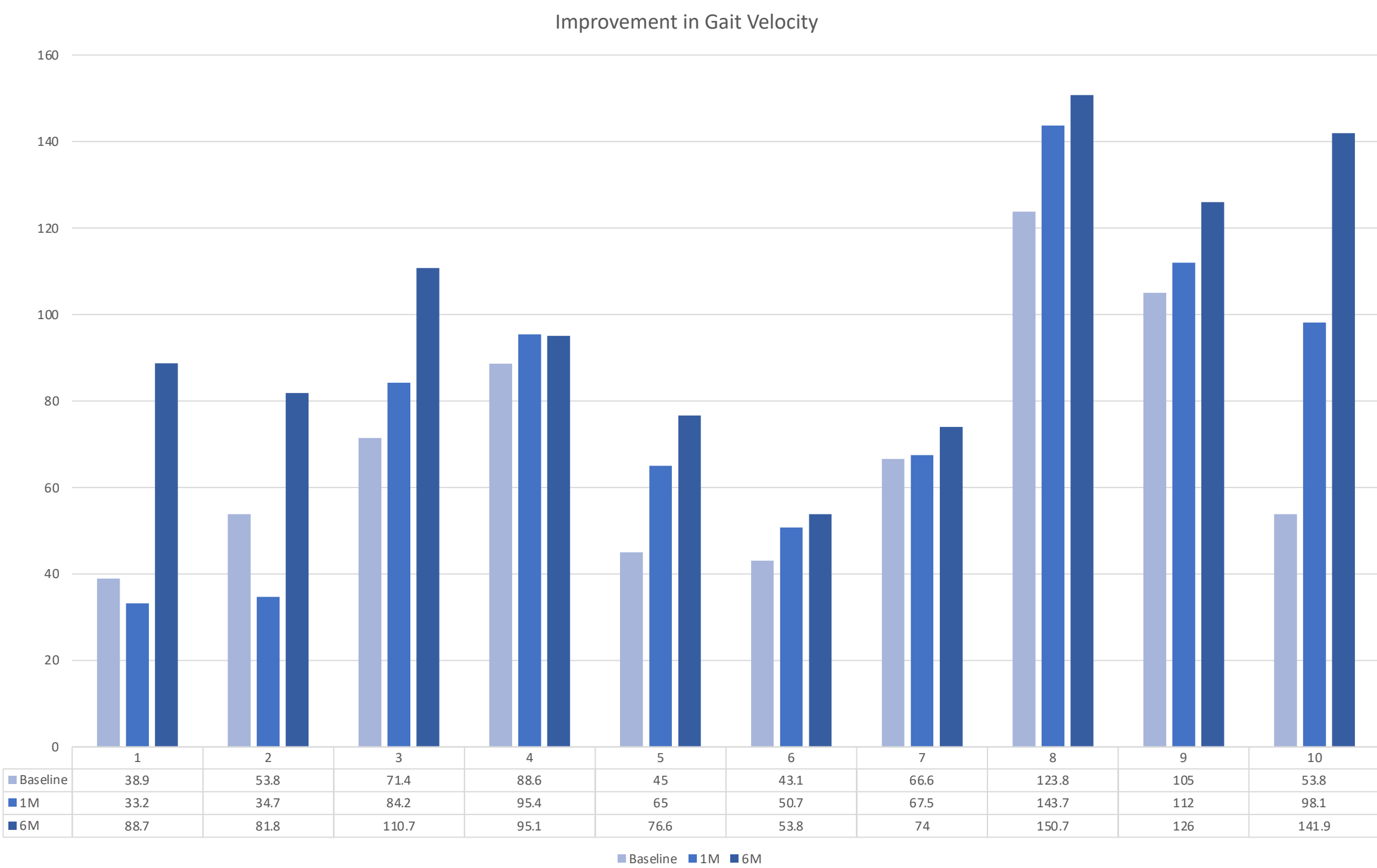


Table 1: Improvement in Gait Velocity

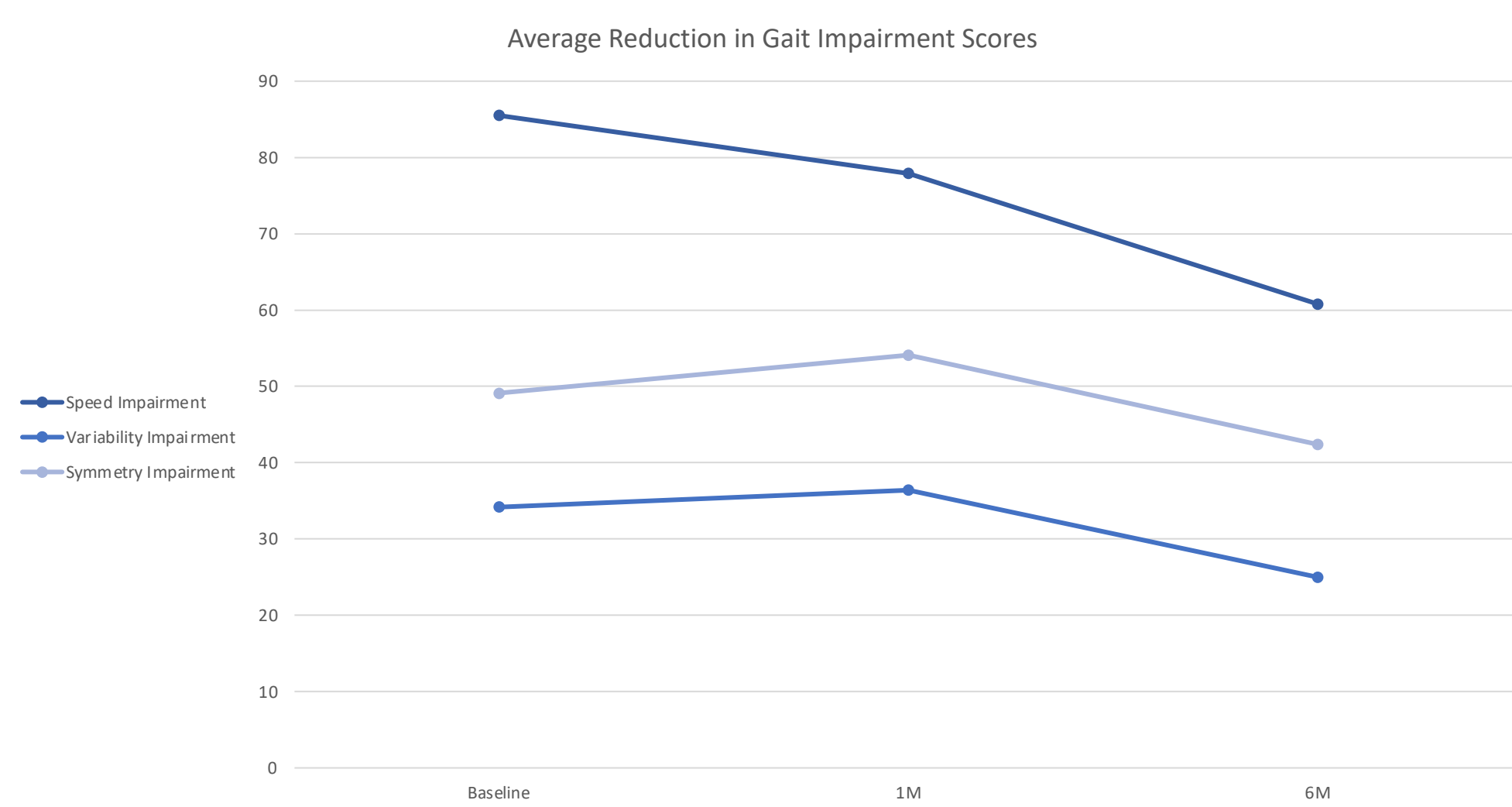


Table 2: Improvement in Gait Impairment

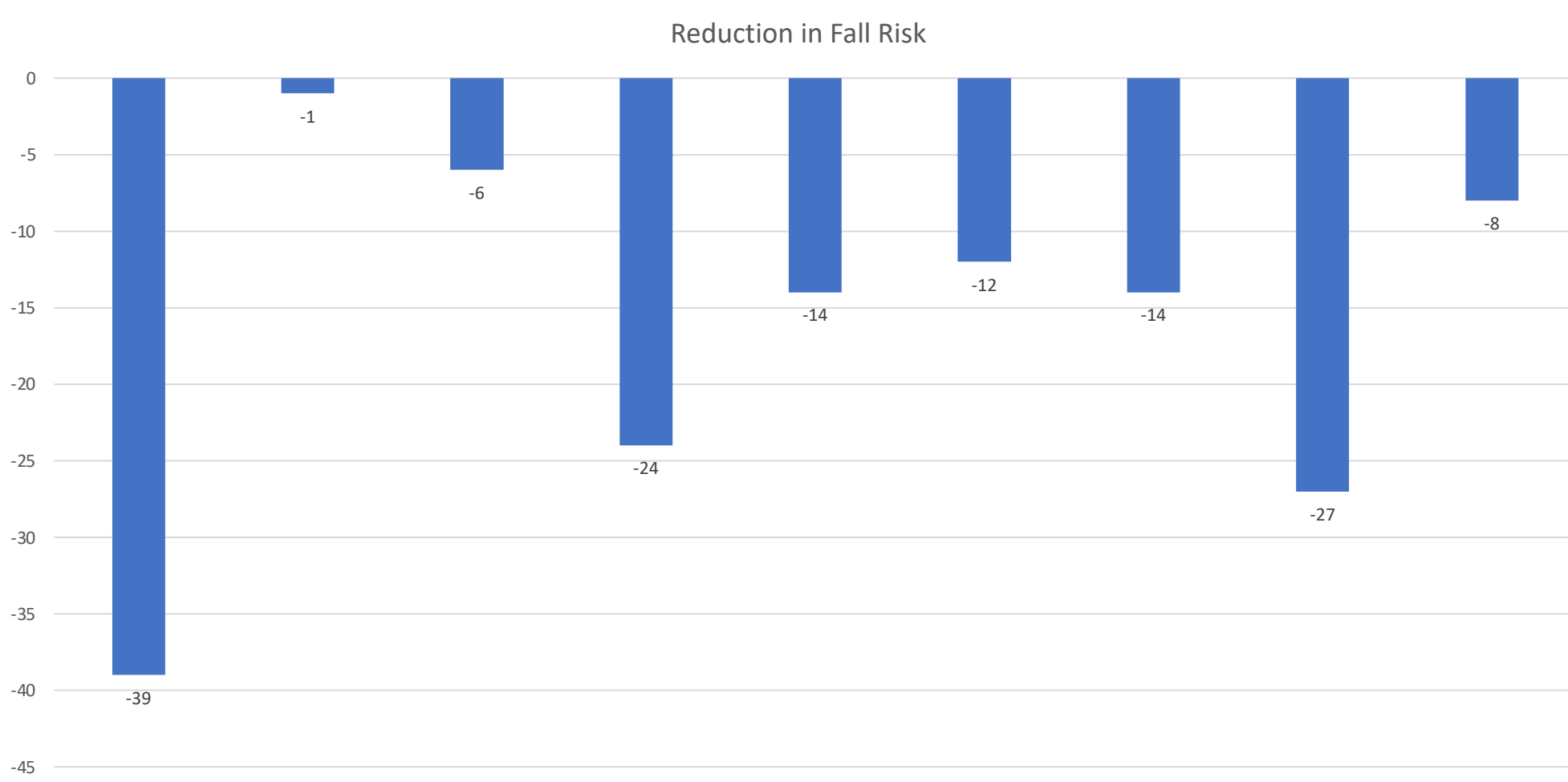


Table 4: Fall Risk

## Results

- In a cohort of 10 patients (52 yo-75yo; 3 male; 7 female) that underwent posterior SIJ fusion and met inclusion/exclusion all were found to have favorable results.
- The average improvement in gait velocity was 24.5 cm/s (6.5-49.8cm/s);
- The average improvement in impairment of speed was 22.1% (4-43%)
- The average improvement impairment of symmetry was 14.5% (1-29%)
- The average improvement impairment of variability was 14.6% (4-29%)
- The average improvement fall risk was 15.5% (1-39%).
- There were no intra-operative or post-operative adverse effects or complications.
- (There was one patient that did present at baseline assessment reliant on a rolling walker that was able to walk without assistive device at 6 months post-operatively.).

## Discussion

As SIJ dysfunction is better understood as a significant contributor of low back pain, it is important to find long term solutions for the improvement of both pain and the restoration of function. Arthrodesis of the sacroiliac joint using an invasive, lateral approach has been the established surgical intervention. This approach although effective in treating pain has been found to have potentially catastrophic adverse complications. Further, this procedure may lead to further gait impairment. According to Busso et al. in a cohort of 21 patients that underwent lateral approach SIJ fusion (both open and percutaneous), long term impaired walking performance was noted, specifically patients walked slower and used shorter steps compared with healthy controls (4).

As demonstrated in this study the minimally invasive posterior SIJ fusion procedure is a safe and effective way in which to improve gait impairment that is caused by sacroiliac joint dysfunction. This improvement in gait impairment can prevent further comorbid conditions and improve fall risk which may lead to significant future medical cost savings for patients with degenerative conditions.

## References

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4. Busso C, Cambursano S, Aprato A, Destefanis C, Gianotti A, Massazza G, Massè A, Minetto MA. Algo-Functional Indexes and Spatiotemporal Parameters of Gait after Sacroiliac Joint Arthrodesis. *Journal of Clinical Medicine*. 2020; 9(9):2860. <https://doi.org/10.3390/jcm9092860>