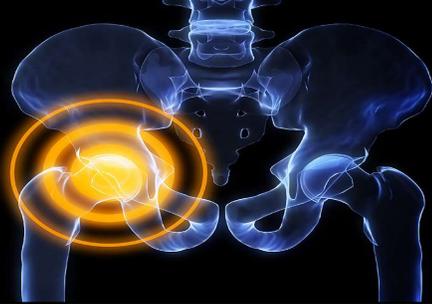


Clinical Variation in Functional Pelvic Tilt in Prospective THA patients with and without Spinal Fusion



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Background

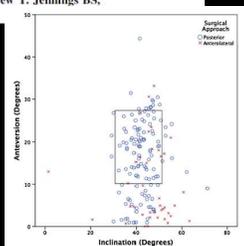


- During normal activity, the pelvis moves in the sagittal plane and is dependent on several factors.
- Spinal fusion and end-stage spinal degeneration have been shown to alter the kinematics of spinopelvic motion.
- Abnormal pelvic tilt can lead to functional malposition of the acetabular component, even if the component is positioned within the classic safe zone.

What Safe Zone? The Vast Majority of Dislocated THAs Are Within the Lewinnek Safe Zone for Acetabular Component Position

Matthew P. Abdel MD, Philipp von Roth MD, Matthew T. Jennings BS, Arlen D. Hanssen MD, Mark W. Pagnano MD

- Lewinnek (JBJS 1978) defined the safe zone as:
 - 40° ± 10° of inclination
 - 15° ± 10° anteversion
- 9,784 hips implanted between 2003 and 2012 at the Mayo clinic
- 58% of dislocations had cups that were **WITHIN** the Lewinnek safe zone.



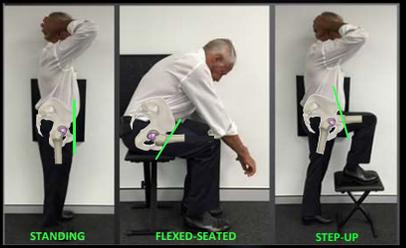
Clin Orthop Relat Res
DOI: 10.1007/s11999-014-4432-5

Background

- Spinal fusion is associated with early dislocation after THA - Gausden et al JOA 2017.
- Vigdorchik et al JBJS 2017
 - Dislocations rates:
 - Without lumbar fusion: **1.55%**
 - 1-2 level fusion: **2.96%** (p<0.0001) - odds ratio of 1.93 for dislocation
 - 3-7 level fusion: **4.12%** (p<0.001). Odds ratio of 2.77 for dislocation

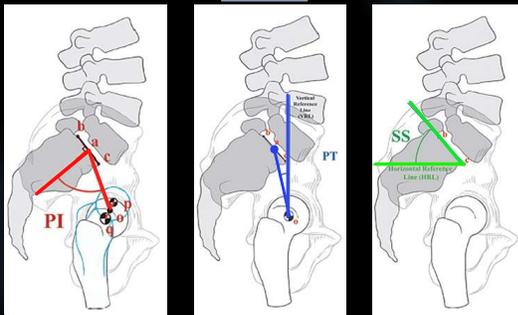
STUDY DESIGN

- Retrospective review
 - 88 patients reviewed from January 2017 to March 2019
 - 69 without prior spinal fusion
 - 19 with spinal fusion
- All patients underwent spinopelvic imaging preoperatively

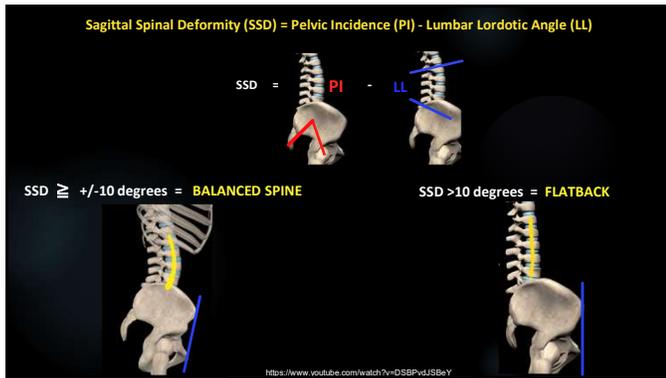


Langston, Pierrepont, Shimmin et al. BJJ 2018

PI = PT + SS



Global Spine J. 2014 Dec; 4(4): 287-296. Jason W. Savage¹ and Alessia A. Patel¹

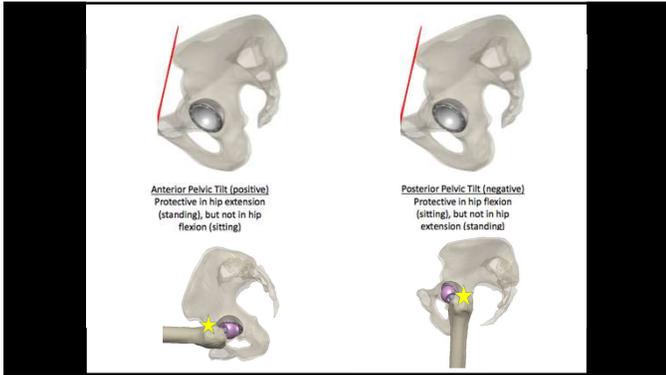


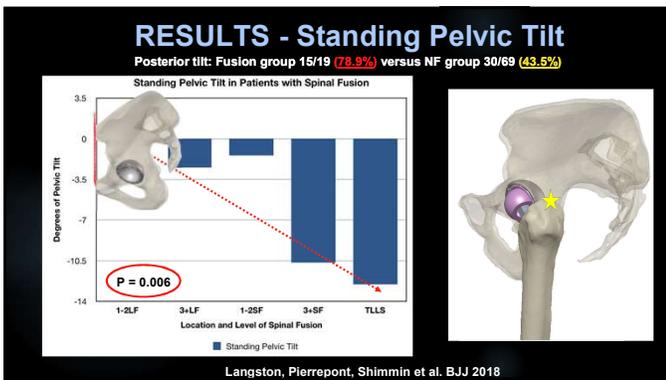
STATISTICS

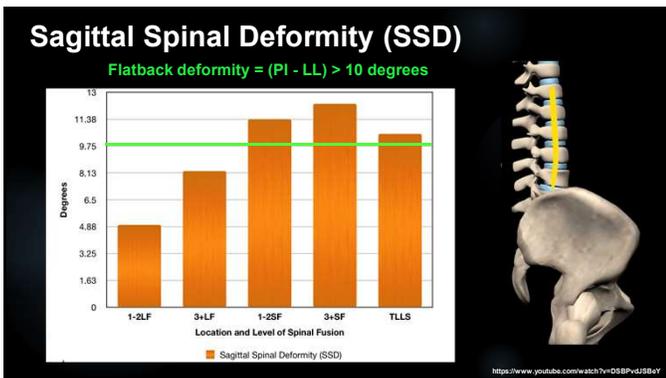
- Two-tailed unpaired Student t-test
 - Fusion vs Non-fusion groups
 - Lumbar Fusion vs Sacral Fusion groups
 - Significance: $p < 0.05$
- A one-way ANOVA was performed on the fusion group that was divided into 5 separate groups:
 - 1-2 level Lumbar fusions (1-2LF)
 - 3+ level Lumbar fusions (3+LF)
 - 1-2 level Sacral fusions (1-2SF)
 - 3+ level Sacral fusions (3+SF)
 - Thoracolumbar-lumbosacral fusions (TLLS)

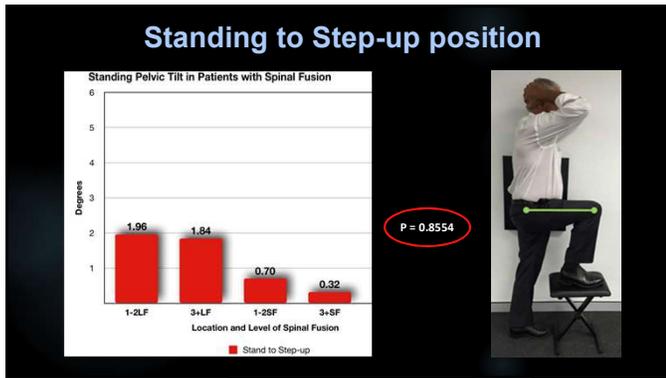
STUDY OBJECTIVES

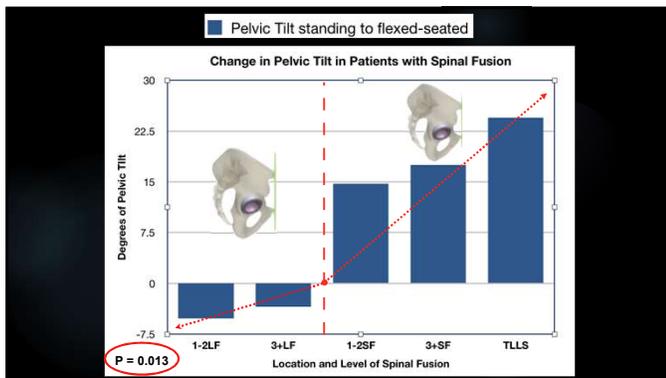
- Evaluate patients w/ and w/o spinal fusion to assess:
 - Pelvic tilt (PT)
 - Sacral slope (SS)
 - Lumbar lordotic angle (LL)
 - Sagittal spinal deformity (SSD)
- Analyze dynamic changes in pelvic tilt between the non-fusion and fusion groups.
- Determine if the length of the spinal fusion or the location of the spinal fusion has a greater influence on spinopelvic mobility.

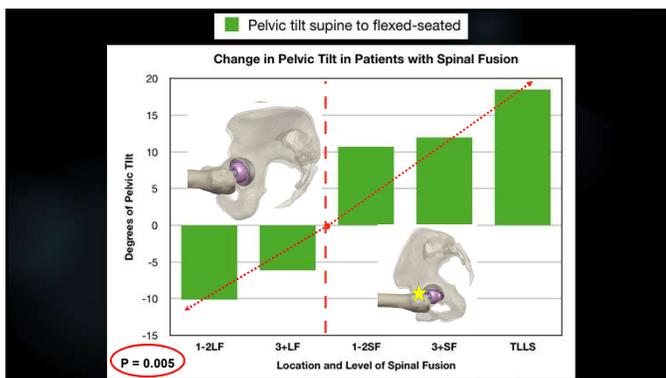












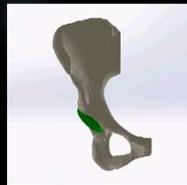
CONCLUSIONS

- **Standing posterior pelvic tilt** is more prevalent in patients with sacral fusions than isolated lumbar fusions
- **Flatback deformity** was found almost exclusively in patients with sacral fusions compared to those with isolated lumbar fusions
- Short 1-2 level sacral fusions had more **unfavorable anterior pelvic tilt** than both 1-2 level and 3+ level lumbar-only fusions in the flexed-seated position.



CONCLUSIONS

- The "safe-zone" is no longer considered a static entity
- Preoperative assessment of patient-specific safe zones is critical prior to undergoing total hip arthroplasty today.
- Functional radiographs can guide the physician on the placement of the acetabular component to maximize impingement-free range of motion



THANK YOU
