

1 **Structured Abstract:**

2 **Background Context:**

3 Sacroiliac joint (SIJ) fusion was traditionally performed exclusively by spine surgeons using an  
4 open direct lateral approach. With advancements in technology, SIJ fusion has evolved into a  
5 minimally invasive percutaneous technique, potentially reducing associated risks. Interventional  
6 Pain Management (IPM) physicians have adopted these technique due to their expertise in  
7 interventional procedures. This rise in SIJ fusions by untrained IPM physicians has raised patient  
8 safety concerns among spine surgeons. With the expanding role of IPM physicians, their  
9 involvement in SIJ fusion, particularly using transfixation implants through a posterior-oblique  
10 approach, has not been thoroughly explored.

11 **Purpose:**

12 To evaluate and compare the safety and efficacy of percutaneous posterior-oblique SIJ fusions  
13 performed by trained IPM physicians using the Sacrix<sup>®</sup> titanium triangular implant (STTI)  
14 (Sacrix LLC, Burlington, MA, USA), under direct spine surgeon supervision versus non-spine  
15 surgeon supervision.

16 **Study Design/Setting:**

17 A prospective, randomized, controlled multicenter cohort study conducted across multiple  
18 ambulatory surgery centers between 2020 and 2022.

19 **Patient Sample:**

20 276 adult patients (mean age 56.7 years; 72.1% female) scheduled for SIJ fusion.

1 **Outcome Measures:**

2 The primary outcome measures were surgical complications, deviations, and revisions. These  
3 were assessed through medical records and radiographs for at least 6 months post operative.

4 **Methods:**

5 Participants were randomly assigned to the spine surgeon supervised (control) group 1 or the  
6 non-surgeon supervised group 2. The latter was further divided into subgroups supervised by  
7 either clinical specialists or sales representatives/independent distributors. All IPM physicians  
8 received comprehensive training on the Sacrix<sup>®</sup> technique by a board-certified orthopedic spine  
9 surgeon. Surgical complications, deviations, and revisions were recorded, with follow-up data  
10 collected for at least twelve months.

11 **Results:**

12 Control group 1 (n = 66) reported no complications, deviations, or revisions. In group 2 (n =  
13 210), 9 complications (3.3%), 4 deviations (1.4%), and 5 revisions (1.8%) were identified,  
14 occurring between the second and fifth postoperative days. Statistical analysis revealed no  
15 significant differences between groups 1 and 2 in complications, deviations, or revisions  
16 (P=0.189, P=0.575) and P=0.343, respectively). The relative risk between non-surgeon  
17 supervised subgroups was 1 (95% CI 0.31–3.14), indicating no significant difference in risk.

18 **Conclusions:**

19 Trained IPM physicians safely performed percutaneous SIJ fusions using the Sacrix<sup>®</sup> technique,  
20 achieving low complication and revision rates similar across both spine surgeon-supervised and  
21 non-surgeon-supervised groups. Notably, direct spine surgeon supervision further minimized

1 intraoperative complications. This study highlights the effectiveness of certifiable training and  
2 mentorship by a spine surgeon in enabling IPM physicians to proficiently perform SIJ fusions.

3 **Keywords:** Sacrix<sup>®</sup>, SI-Bone, iFuse, Sacroiliac Joint Fusion, SIJ Fusion, Titanium Triangular  
4 Implant, Posterior-Oblique, Interventional Pain Medicine.

5