



## A Comprehensive Look at Sacral Dymorphism and a Review of Altered “Safe Zones” in Sacroiliac Screw Fixation

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### Abstract:

Sacral dymorphism (SD) is a congenital anomaly found in up to 54% of the population. This includes abnormalities within the lumbosacral joint and its surrounding structures, presenting increased risk in the surgical repair of posterior pelvic ring injuries. Iliosacral and transsacral screw fixation is greatly influenced by these anatomical variations, consequently altering surgical planning. A systematic review was performed with the following objectives: to determine the overall prevalence of SD; to summarize the implications of its anomalies in surgery; and to describe the altered safe zones that may be available to orthopaedic surgeons. Inclusion criteria included studies that reported the statistical prevalence of SD and their associated features. Data collected included patient demographics, prevalence of SD, quantification or classification of dymorphic anatomy, and postoperative complications. Our analysis demonstrated a prevalence of 23% among 1,983 pelves in 11 studies. Among the seven known dymorphic criteria, only three have been considered significant in the evaluation of screw placement. Approximately 95% of dymorphic sacra can accept an S2 transsacral transiliac screw compared to 50% in normal counterparts. Additional evidence suggests viable fixation pathways in dymorphic S3. These results led to the conclusion that SD is a relatively common condition that appears to present on a spectrum of severity, yet the variability in dymorphic anatomy complicates the development of a universal solution to biomechanical fixation. Standard protocol suggests fixation of dymorphic sacra at S2 when S1 is not viable, as lower sacral segments have



been found to yield greater opportunity in this patient population.

### Biography:

Samuel Eaddy has completed his Master’s in Physiology and Biophysics from Georgetown University and is currently an OMS-II at Nova Southeastern University College of Osteopathic Medicine. He has conducted clinical research in various specialties since 2014, and is currently working with a team of residents and medical students to advance multiple orthopaedic studies at the Boward Health Medical Center, which is home to a reputed orthopaedic surgery residency program in South Florida.

### Publication of speakers:

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2. Weather strip for jalousie windows G Samuel - US  
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under the Longshoremen’s and Harbor Workers’  
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