*Supplemental File 1: Mesh terms and Boolean operators with inclusion and exclusion criteria for study.*

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| **MesH Terms:**   * **Ilium/Anatomy & Histology**    + **Or** * **Ilium/Radiography**   + **or** * **Sacrum/Anatomy & Histology\***   + **or** * **Sacrum/Blood Supply**   + **or** * **Sacrum/Innervation**   + **Or** * **Sacrum/Surgery**   + **or** * **Sacrum/Radiography**   + **or** * **Sacrum/Ultrastructure**   + **Or** * **Iliac Vein/Injuries**   + **Or** * **Lumbosacral Plexus/Injuries**    + **And** * **Anthropometry**   + **or** * **Cadaver**   + **or** * **Tomography, X-Ray Computed**   + **or** * **Radiographic Image Interpretation, Computer-Assisted**   + **or** * **Fluoroscopy**    + **Or** * **Bone screws**   **Filters:**   * **Humans** * **Adults** * **English** |
| **Inclusion Criteria:**     * **Study population:**    + **Studies were done in humans or human specimens**   + **Studies were done on adults**   + **Study was conducted after the year 1980** * **Study Design**   + **Cadaveric analysis of anatomy**   + **Radiographic analysis of anatomy**   + **Studies meeting the first two criteria which pertain to instrumentation of the sacrum or ilium**   **Exclusion Criteria:**   * **Primarily Clinical or biomechanical in nature** * **Animal study** * **Sacroplasty** * **Language other than English** |

*Supplemental File 2: Articles related to S1 and S2 pedicle screw placement.*

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| **S1 PEDICLE SCREW** | | | **S2 PEDICLE SCREW** | | |
| **Primary Article** | **Degrees Lateral** | **Average Screw Length** | **Primary Article** | **Degrees Lateral** | **Average Screw Length** |
| ***Anterolateral Trajectory*** | | | | | |
| Asher (Male) | 25° | 39mm | Asher (Male) | 30° | 31mm |
| Asher (Female) | 25° | 37mm | Asher (Female) | 30° | 28mm |
| Mircovic (Group 1) | 30° | 38mm | Xu | 30° | 34mm |
| Mircovic (Group 2) | 45° | 44mm |  |  |  |
| Xu | 30° | 37mm |  |  |  |
| Arman | 33° | 50mm |  |  |  |
| ***Straight Forward Trajectory*** | | | | | |
| Xu | 0˚ | 30mm | Xu | 0˚ | 28mm |
| Ota | 0˚ | 43mm |  |  |  |
| ***Anteromedial Trajectory*** | | | | | |
| Ota | 23° | 46mm | Xu | 30° | 32mm |
| Xu | 30° | 37mm |  |  |  |
| Asher (Male) | 35° | 50mm |  |  |  |
| Asher (Female) | 35° | 47mm |  |  |  |
| Arman | 36° | 51mm |  |  |  |

*Supplemental File 3: Articles related to pelvic instrumentation (S2 Alar Screw and Iliac Screw).*

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| **2 ALAR SCREW** | | | | | | |
| **Primary Article** | **Starting Point** | **Transverse Plane  Degrees Lateral** | **Sagittal Plane  Degrees Caudal** | **Average   Screw Length** | | **Study Type/n=** |
| Chang | 25mm from superior endplate of S1 and 22mm lateral of midline at the S2 level. | 39° | 38° | 105mm | | CT/20 |
| Zhu (Male) | 1mm inferior and 1mm lateral to the S1 dorsal foramen | 37° | 30° | 121mm | | CT/20 |
| Zhu (Female) | 36° | 35° | 115mm | |
| O'Brien | 1mm inferior and 1mm lateral to the S1 dorsal foramen | 40° | 33° | 84mm | | Cadaver/10 |
| **ILIAC SCREW FIXATION** | | | | | | |
| **Primary Article** | **Starting point** | | | | **Average**  **Screw Length** | **Study Type/n=** |
| Miller | S2-S3 | | | | 140mm | Cadaver/72 |
| Berry (Male) | PSIS-AIIS | | | | 147mm | Cadaver/129 |
| Berry (Female) | PSIS-AIIS | | | | 141mm |
| Berry (Male) | PSIS-SAR | | | | 128mm |
| Berry (Female) | PSIS-SAR | | | | 125mm |
| Zheng | PSIS-AIIS | | | | 141mm | Cadaver/60 |
| Park | PSIS-AIIS | | | | 111mm | Cadaver/90 |
| Tian (Male) | PSIS-AIIS | | | | 135mm | Cadaver/18 |
| Tian (Female) | PSIS-AIIS | | | | 125mm |
| Liu (Group 1) | PSIS-AIIS | | | | 139mm | Patients/100 |
| Liu (Group 2) | CLIC-UEA | | | | 141mm |
| Schwend | 2cm inferior to PSIS | | | | Not reported | Cadaver/20 |

Abbreviations: PSIS (posterior superior iliac spine), AIIS (anterior inferior iliac spine), SAR (superior acetabular rim), UEA (Upper edge of acetabulum), CLIC (chilotic line of posterior iliac crest

*Supplemental File 4: Articles related to iliosacral screw.*

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| **ILIOSACRAL SCREW** | | **S1** | | | **S2** | | |
| **Primary Article** | **Starting Point** | **Vestibule**  **Area** | **Transverse**  **Plane Degrees**  **Anterior** | **Sagittal**  **Plane Degrees**  **Cephalad** | **Vestibule**  **Area** | **Transverse**  **Plane Degrees**  **Anterior** | **Sagittal**  **Plane Degrees**  **Cephalad** | **Study Design** | **n=** |
| Carlson (Male) | Inferior to the S1 foramen and posterior to the S1 body (was found to be ideal) | 524mm2 | 0-25° | 19-45° | 253mm2 | 0-16° | 0-16° | CT | 30 |
| Carlson (Female) | 450mm2 | 213mm2 |
| Gardner\* | Not Reported | 346mm2 | 4° | 21° | 109mm2 | 7˚ | 4˚ | CT | 50 |
| Ebraheim | 3-3.5cm anterior to posterior surface of ilium in sagittal plant and 3.5-4cm superior to the greater sciatic notch. | | | | |  |  | Cadaver | 11 |

\*These values were obtained via a “true coronal” reformatted CT.

*Supplemental File 5: Anatomic parameters of the bony corridor.*

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| **ANATOMIC PARAMETERS OF THE BONY CORRIDOR** | | | | | | | | | |
| **S1 (unless otherwise specified)** | | | | | | | | | |
| **Primary Article** | **Study Type** | **n=** | **Dorsal Pedicle Height** | | **Posterior Lateral  Mass Width** | | **Pedicle Depth** | **Transverse Diameter** | |
| **Male** | **Female** |  | **Male** | **Female** |
| Xu | Cadaver | 40 | S1 | 26mm | 21mm | |  |  | |
|  | |  | S2 | 14mm | 18mm | |  |  | |
|  | |  | S3 | 11mm | 15mm | |  |  | |
| Arman | Cadaver | 100 | S1 | 21mm |  | | 25mm | 49mm | |
|  | |  | S2 | 16mm |  | |  |  | |
| Ebraheim | Cadaver | 11 | 26mm | |  | | 28mm |  | |
| Xu | Cadaver | 50 | 21mm | |  | |  | 44mm | 42mm |
| Jackson | CT | 50 |  | | 27mm | 29mm |  |  | |
| Asher | Cadaver | 49 | 22mm | |  | |  | 44mm | 42mm |
| Esses | Cadaver | 27 | 23mm | | 37mm | |  |  | |

*Supplemental File 6: Anterior neurovascular structures.*

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| **ANTERIOR NEUROVASCULAR STRUCTURES** | | | | | | | | |
| **Primary Article** | **Study Type** | **n=** | **Location of Aortic Bifurcation** | **Location of Common Iliac Vein Confluence** | **Distance Between Left and Right Iliac Vessels** | **Distance from Internal Iliac Vein to Sacrum (Sagittal)** | **Distance of Left Internal Iliac Vein to Midline (Coronal)** | **Median Sacral Artery Size and Location** |
| Mirkovic | Cadaver | 22 |  | Right side of L5 VB |  | 2mm |  |  |
| Liu | CT | 62 | Axial plane: 68% Located at L4 VB L4/5 Disc space.  Sagittal plane: 87% located in the middle 1/3 VB | Axial plane: 61% located at the L5 VB  Sagittal Plane: the right side in 100% of patients | 43mm at superior boundary of S1 |  |  |  |
| Tribus | Cadaver | 37 |  |  | 34 mm at top of L5/S1 disc |  | 12mm | 3mm in diameter and crossed the superior aspect of L5-S1 disc space on average 4mm to the left of midline. |
| Datta | CT | 76 | 52% @ L4 VB | 48% at L4/5 disc space |  |  |  |  |
| Ota | CT | 34 |  |  |  | 6mm left, 7mm right | 19mm at position of S1PS (variable) |  |
| Esses | Cadaver | 27 | Left anterior surface of L4 VB |  |  |  | Midline |  |
| Sae-Jung | Cadaver | 54 |  |  |  |  |  | 33mm from right side of L5 VB, 24mm from left side |
| Güvençer | Cadaver and MRI | 20 |  |  |  |  |  | 55% found 8mm from midline on right side of S1-S2 |

*Supplemental File 7: Anatomic parameters of the ilium.*

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| **ANATOMICAL PARAMETERS OF THE ILIUM** | | | |
| **Primary Article** | **Type of Study** | **n=** | **Bony Dimensions of Iliac Column at the Sciatic Notch** |
| Miller | Cadaver | 36 | 32mm x 23mm (width) |
| Berry | Cadaver | 129 | 20mm (width) |
| Zheng | CT | 60 | 23mm (Male) 19mm (Female) |

*Supplemental File 8: Bone Mineral Density.*

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| **BONE MINERAL DENSITY** | | | | | | |
| **Primary Article** | **Study Type** | **n=** | **Age Range** | **Measured Units** | **Site of Measurement** | **Primary Finding** |
| Salazar | CT | 25 | 18-50 | CT Hounsfield Units (HU) | Average of 4 standardized regions  of Interest (ROI) at the S1 and  S2 levels | S1 > S2 in HU |
| Peretz | Cadaveric | 17 | 46-79 | Cortical Thickness (mm) | Anterior and Posterior Cortex of  the Sacrum | S1 & S2 > S3 & S4 in cortical  thickness (mm) |
| Wagner | CT | 91 | 27-83 | CT Hounsfield Units (HU) | Transsacral Corridor of S1 and S2 | Averaged along the transsacral  corridor S1 > S2 in HU |
| Ebraheim | Cadaveric | 7 | 57-78 | Trabecular Orientation | Transverse Section of Upper S1,  Middle S1, S2, S3, S4 One Coronal Section Three Sagittal Sections | Condensation Zones of  Trabeculae are located in the  anterior part of the lateral mass  in both S1 and S2 |
|  | Cadaveric | 40 | 61-67 | Cortical Thickness (mm) | Mean Anterior Cortex S1-S3 | Cortical Thickness S1>S2>S3 |
|  | Cadaveric | 40 | 61-67 | Relative Density \*\* | Zone 1, 2, 3 Lateral to Medial Sagittal Density Measurements  from Anterior to Posterior of each  zone | Anterior Cortex of S1 and S2  has the highest density of the  sacrum |
| Ebraheim | Cadaveric | 40 | 61-76 | Cortical Thickness (mm) | Anterior Cortex Anterolateral Anteromedial | Cortical Thickness S1 > S2 |

\*\*Use of Relative Density relied on radiolucency of CT scans