

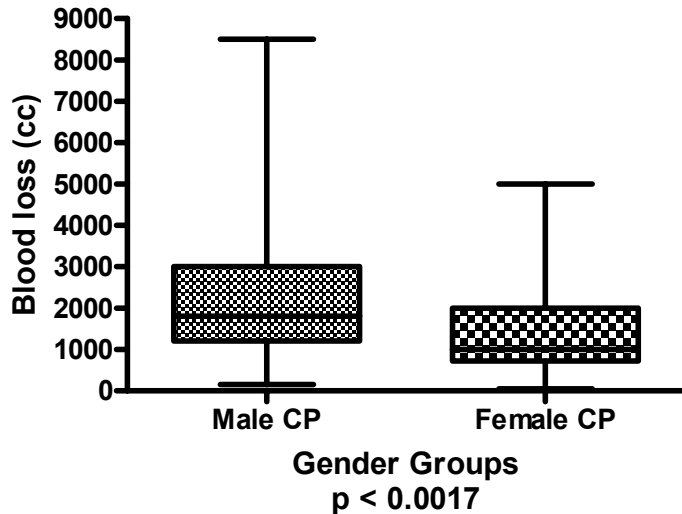
## Male Patients with Cerebral Palsy Bleed More during Posterior Spinal Fusion and Reconstruction

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**Introduction:** Major blood loss during surgery in pediatric age population is a problem of special concern. In this regard, posterior spinal fusion is commonly associated with the most serious blood loss, particularly in children with neuromuscular disorders such as cerebral palsy<sup>1</sup>. The average blood loss in this population is reported to be anywhere from two to six times more than patients with idiopathic scoliosis. Moreover, many patients with a neuromuscular disorder have a relatively low blood volume due to low body weight. Because of these issues we wanted to determine if other characteristics of cerebral palsy patients can predict those patients at increased risk for blood loss during posterior spinal fusion and reconstruction.

**Results:** These studies were approved by the Institutional Review Board and Johns Hopkins Medical Institutions. We retrospectively analyzed 400 patients who underwent spinal fusions at Johns Hopkins Hospital Children's Center from 1997-2002. One hundred thirty-eight patients were diagnosed with neuromuscular scoliosis due to cerebral palsy. Patients were paired for both weight and age. Patients with known coagulopathy were excluded from the study. Factors analyzed in this patient group include gender, the amount of blood loss. Data was analyzed using Mann-Whitney non-parametric t test. Our results were plotted in the following diagram. Our studies show that male patients with cerebral palsy have significantly more blood loss ( $2325 \pm 1799$  cc, N=81) when compared to female patients ( $1520 \pm 1203$  cc, N=57,  $p < 0.0017$ ).



**Discussion:** Even though it is well known that patients with cerebral palsy have significantly more blood loss compared to patients with idiopathic scoliosis, the mechanism is unclear. A recent study suggested that consumption of coagulation factors may play an important role in this regard<sup>2</sup>; however, this has not been proven in our study population. Ours is the first study that demonstrates male gender may be an independent predictor of extensive blood loss in patients with cerebral palsy undergoing posterior spinal fusion. These studies may suggest that other mechanisms including genetics and gender may have a role in blood loss cases where massive transfusion is required.

### Reference:

1. Shapiro F, et al. Eur Spine. 2004; 13: S6-S17.
2. Brenn B, et al. Spine. 2004; 29: 15 Pp 310-314.