## 90 Day Return to the ED following Spinal Deformity Surgery: An Analysis of 694 Patients

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INTRODUCTION: Return to the hospital following surgery is commonly used as a quality metric. This study aims to determine the causes and risk factors for ED visits within 90 days of spinal deformity surgery.

METHODS: 694 pediatric patients with spinal deformity who underwent a posterior spinal fusion from 2011 to 2022 were included. Radiographic, surgical, and hospital stay information was collected and presented as medians and interquartile ranges (IQR) for continuous data, and frequencies/percentages for categorical data. Chi-squared was utilized to analyze categorical data, whereas Kruskal-Wallis tests were utilized to examine continuous metrics. Patients who returned to the ED within 90 days for any reason were analyzed. ED appointments were classified as either medical or surgical. Medical visits included but not limited to fever, pain, and seizures. Surgical visits included wound and surgical site infections but were not limited to these conditions.

**RESULTS:** 

86 patients returned to the ED within 90 days and 608 did not. Of the returns to the ED, 61(70.9%) returned for medical reasons while 25 (29.1%) returned for surgical reasons. Those that returned to the ED had greater total hospital stay morphine consumption (3.61mg/kg vs 2.86 mg/kg, p=0.015) and greater initial length of stay (5.0 vs 4.0, p=0.001). Patients who experienced hospital stay complications, spent three or more days in the ICU, or those who were not extubated in the operating room were more likely to return the ED (p < 0.001, p = 0.005, and p = 0.012, respectively). Patients that took 0 days to achieve out of bed activity revisited the ED more than those that took 1 or more days (p < 0.001). Patients with neuromuscular scoliosis (n=87) were significantly more likely to return to the ED than those without (p<0.001).

Logistic regression showed that patients with neuromuscular scoliosis were more likely to visit the ED within 90 days (OR: 2.83, 95 % CI:1.16-0.90, p = 0.022) as well as those who experienced hospital stay complications (OR: 3.62, CI: 1.79-7.33, p < 0.001).

DISCUSSION AND CONCLUSION: Within 90 days, 12.4% of patients returned to the ED, primarily with medical complaints. Patients were more likely to return to the ED if they had longer LOS, achieved OOB quicker, and had greater morphine consumption. Neuromuscular scoliosis and hospital stay complications were identified as independent risk factors that significantly increase the likelihood of return to ED within 90 days. It is essential to monitor these metrics closely to prevent any negative and avoidable outcomes.