

## The Use of the Semi-Sterile Technique for Closed Reduction and Percutaneous Pinning of Upper Extremity Fractures in Pediatric Patients

Karan Dua, MD<sup>1</sup>; Charles Blevins, BS<sup>1</sup>; Joshua Abzug, MD<sup>2</sup>

<sup>1</sup>University of Maryland School of Medicine, Baltimore, Maryland, USA

<sup>2</sup>University of Maryland School of Medicine, Timonium, Maryland, USA

**Background/Purpose:** Closed reduction and percutaneous pinning (CRPP) is commonly utilized for pediatric upper extremity fractures. The technique is traditionally performed following full surgical prep and draping, which can be inefficient and wasteful of materials. The semi-sterile technique has been shown to have no difference in infection or complication rates when utilized for pediatric supracondylar humerus fractures. The purpose of this study was to compare the use of the semi-sterile technique versus the full prep and drape technique for CRPP procedures of all pediatric upper extremity fractures.

**Methods:** A retrospective review was conducted of all pediatric patients who underwent CRPP of an upper extremity fracture. There was a gradual transition from utilizing the full prep and drape technique to the semi-sterile technique. Demographic data, fracture type and location, and length of pin fixation were recorded. Qualities of intraoperative care were assessed including average length of surgery, room set-up time, and room cleaning time. Additionally, parameters of postoperative care were recorded including average length of follow-up and complication rates. Simple statistics and unpaired *t* tests were performed.

**Results:** 224 patients were reviewed including 162 in the semi-sterile group and 62 in the full prep group. The average length of surgery was 32 minutes (range, 11-110) in the full prep group compared to 26 minutes (range, 7-69) in the semi-sterile group ( $P = 0.007$ ). The average room set-up time in the full prep group was 20.1 minutes compared to 18.4 minutes in the semi-sterile group (Table 1). Furthermore, the average operating room cleaning time in the full prep group was 18.8 minutes compared to 16.8 minutes in the semi-sterile group. When assessing the set-up time, procedure time, and clean-up times together, the combined average times were 71.1 minutes in the full prep group and 61.3 minutes in the semi-sterile group, for a difference of 9.8 minutes. The average time to pin removal was 27.5 days (range, 5-76). The average length of follow-up was 68 days (range, 15-365) with patients being followed on average for 37 days after pin removal. Two complications in the full prep group occurred including one pin tract infection and one physeal arrest.

**Conclusion:** The semi-sterile technique is a safe and cost-effective alternative that should be used when performing CRPP of all pediatric upper extremity fractures. The full prep technique increases operating room time and medical waste, and therefore should not be utilized given the effectiveness of the semi-sterile technique.

**Table 1: Intraoperative Data**

<b>Category</b>	<b>Full-Prep: Average Time (mins)</b>	<b>Semi-Sterile: Average Time (mins)</b>
Room Set-Up	20.13	18.38
Time Patient in the Room	62.98	52.17
Prep Time	5.77	5.37
Anesthesia Time	62.00	52.00
Procedure Time	32.10	26.06
Clean Time	18.84	16.82
Set-Up + Clean Time	38.97	35.20
<b>Set-Up + Procedure Time + Clean Time</b>	<b>71.07</b>	<b>61.26</b>