

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

Charles J. Blevins, BS, Karan Dua, MD, Joshua M. Abzug, MD

Department of Orthopaedics, University of Maryland School of Medicine, Baltimore, MD

## Introduction:

- The vast majority of operative upper extremity pediatric fractures can be treated utilizing closed reduction and percutaneous pinning (CRPP).
- The norm is to perform a full surgical prep and drape during these procedures, which can be wasteful of materials.
- The semi-sterile technique is proven to be safe in treating pediatric supracondylar fractures.
- Semi-sterile technique → Sterile towels and sterile gloves only. Prep of the limb with chlorhexidine paint. No scrubbing, drapes or gowns.

## Objectives:

- Determine the safety and efficacy of the semi-sterile technique for treatment of all pediatric upper extremity fractures.

## Methods:

- Retrospective review of all pediatric patients who underwent CRPP of an upper extremity fracture over a four year period.
- Case control series: full prep vs. semi-sterile technique for limb preparation.
- Demographic data, fracture type and location, and length of pin fixation were recorded. Qualities of intraoperative and postoperative care were assessed.
- Simple statistics and unpaired t-tests were performed.

Study Characteristics	Total
Total Pediatric Patients	224
Average Age	8.3 y/o
Full Sterile Prep Technique	62
Semi-Sterile Prep Technique	162

Bone	Fracture Type/Location	# Cases	Total
Humerus	Supracondylar	90	102
	Lateral Condyle	7	
	Proximal	2	
	Distal	3	
Radius	Distal	54	54
Ulna	Distal	1	1
Metacarpal	4th Digit	2	17
	5th Digit	15	
Phalange	Thumb	8	50
	Index Finger	4	
	Long Finger	8	
	Ring Finger	6	
	Small Finger	24	
Total Fractures = 224			

Category	Full-Prep: Average Time (mins)	Semi-Sterile: Average Time (mins)
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
Operative Time	32.10	26.06
Clean Time	18.84	16.82
Set-Up + Clean Time	38.97	35.20
<b>Set-Up + Operative Time + Clean Time</b>	<b>71.07</b>	<b>61.26</b>

## Results:

- 224 patients reviewed:
  - Full prep group: 62 patients.
  - Semi-sterile group: 162 patients.
- Average length of surgery (p = .007):
  - Full prep group: 32 minutes (range 11-110)
  - Semi-sterile group: 26 minutes (range 7-69).
- Average operating room cleaning time:
  - Full prep group: 18.84 minutes
  - Semi-sterile group: 16.82 minutes
- Average set-up + operating + cleaning time:**
  - Full prep group: 71.07 minutes**
  - Semi-sterile group: 61.26 minutes**
- Complications:
  - One pin tract infection & one physeal arrest in full prep group
  - Three patients had a nerve palsy following supracondylar fracture.

## 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.
- Full prep adds medical waste while increasing costs and should be abandoned.