

# UC San Diego

## Independent Study Projects

### Title

Streamlining management of distal forearm buckle fractures in a pediatric emergency department

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**Title:** Streamlining Management of Distal Forearm Buckle Fractures in a Pediatric Emergency Department

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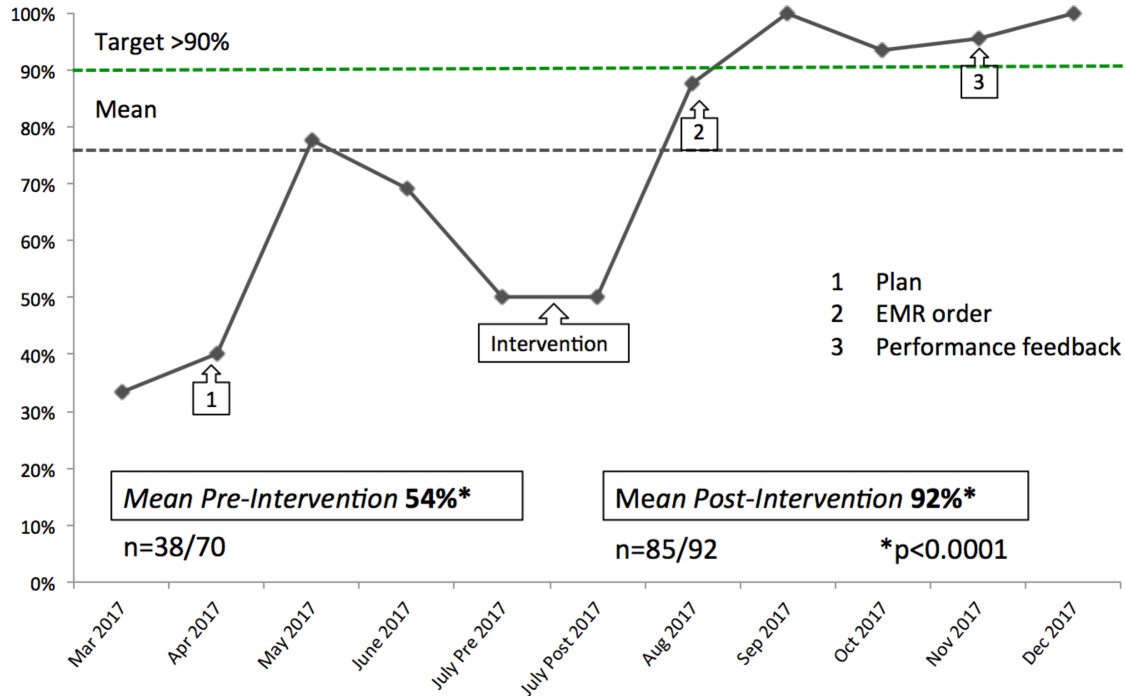
**Background:** Distal forearm buckle fractures are common, inherently stable pediatric fractures. Immobilization, achieved with a removable splint is better tolerated, cheaper, and more efficient than cast treatment without increasing rates of re-fracture. Our children's hospital emergency department (ED) had no standardized protocol for the management of these fractures, resulting in varied immobilization methods, orthopedic consultations in the ED, and long lengths of stay.

**Objective:** To increase the rate of removable splint placement in children 3-15 years of age with distal forearm buckle fractures from a baseline of 54% to greater than 90% and reduce the rate of orthopedic consultations in these patients from a baseline of 35% to less than 10% within 3 months.

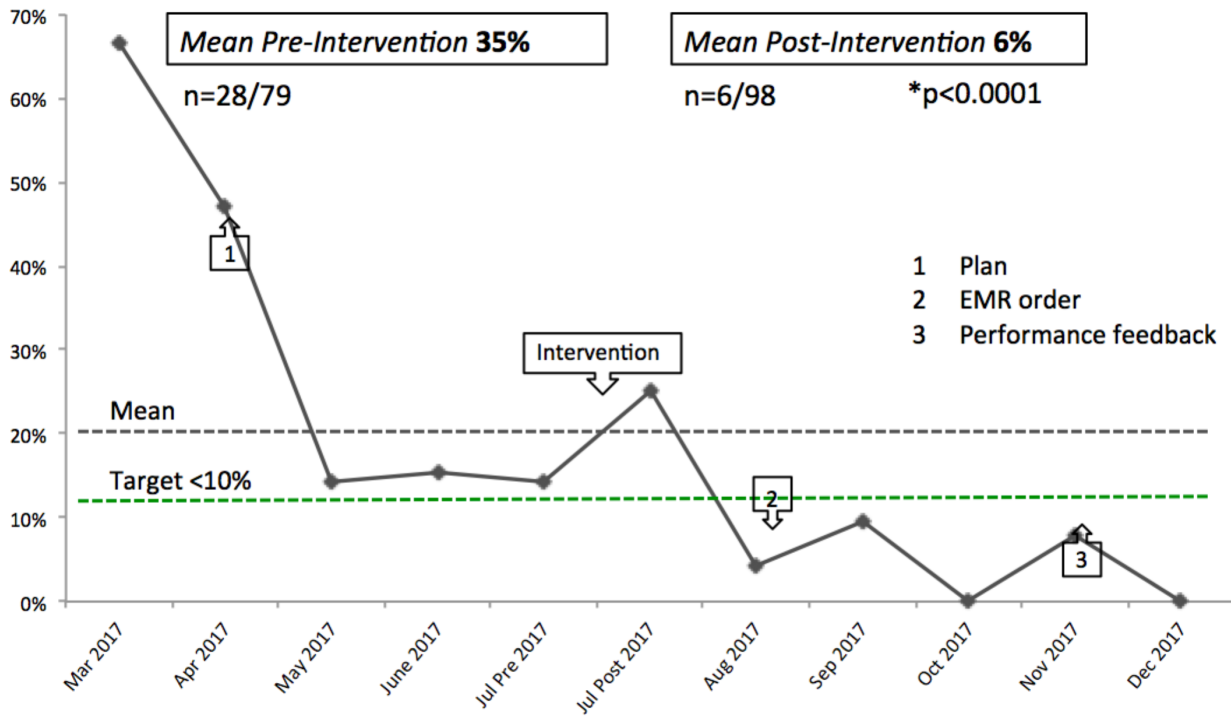
**Methods:** Plan-Do-Study-Act cycles were initiated April 2017. Published literature and existing data were reviewed. A standardized ED protocol of removable splint placement and outpatient orthopedic follow-up in 1 week for patients aged 3-15 years with distal forearm buckle fractures was created in collaboration with the department of orthopedics and initiated July 2017. Nurses, ED, and orthopedic providers were educated on the protocol in the form of presentations, posters displayed in the ED, and e-mail reminders. A specific electronic medical record order for removable splint was created. Outcome measures included proportion of removable splint placement, proportion of orthopedic consultations and length of stay (LOS). Balancing measures were rate of re-fracture and rate of discordant diagnosis between the ED and orthopedic provider.

**Results:** Rate of removable splint placement increased from 54% (n=70) before to 92% (n=92) after protocol initiation ( $p<0.0001$ , Figure 1). Rate of orthopedic consultation in the ED decreased from 35% (n=79) to 6% (n=98) ( $p=0.0001$ , Figure 2). LOS did not change significantly after protocol initiation. Rate of discordant diagnosis did not change significantly, 27% (pre) to 34% (post) ( $p=0.35$ ). There were no re-fractures before or after protocol initiation.

**Conclusions:** In our children's hospital ED, a collaborative protocol and simple education increased use of removable splints and reduced orthopedic consultation in the management of distal forearm buckle fractures without increasing rates of re-fracture or discordant diagnosis. Next steps will include ensuring a sustained improvement, further education to reduce the rate of discordant diagnosis and expanding an EMR order set to include all fracture types and corresponding immobilization.



**Fig 1.** % Removable splints ordered by ED providers for patients diagnosed with distal forearm buckle fractures.



**Fig 2.** % Orthopedic consults, in-person and phone, from ED for patients with distal forearm buckle fractures.

This project was accepted for oral presentation at Western SAEM in Albuquerque, NM, February 3, 2018 and for presentation at SAEM in Indianapolis, Indiana May 15-18, 2018.