The Development of a Clinical Practice Guideline for Distal Forearm Buckle Fractures in a Pediatric Emergency Department

Robert Day, DNP, APRN, FNP-BC, CPEN

Villanova University M. Louise Fitzpatrick College of Nursing

Clinical Problem

- There is a lack of standardized care for distal forearm buckle fractures at Nemours.
- The majority of patients receive a custom fiberglass splint and are referred to orthopedics.
- In orthopedics, some patients are casted while others are given a prefabricated wrist splint. Some have repeat radiographs while others do not.
- Variation in practice creates increased cost, wastes time, and burdens the crowded cast clinic.

Purpose

Create a clinical practice guideline that will standardize the care and treatment of distal forearm buckle fractures at Nemours/Alfred I. duPont Hospital for Children's Emergency Department

Objectives

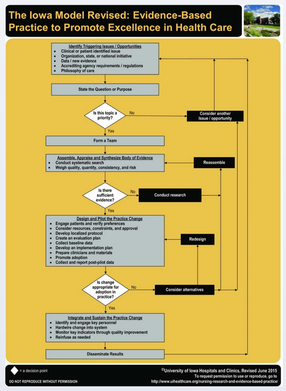
- Design and implement a clinical practice guideline.
- Educate providers and families on proper treatment.
- Measure and increase the rate of prefabricated wrist splint use for patients who meet inclusion criteria.
- Measure and reduce follow-up rate.
- Measure and reduce repeat immobilization rate.
- Measure and reduce repeat imaging.

Literature Review

Author	Topic	Summary
Callender, O., & Koe, S. (2015)	Splinting of torus fractures of distal forearm	One hundred nineteen children in a clinic splinted for distal forearm buckle fracture were studied. No adverse events or follow up needed after splinting.
Williams, K.G., Smith, G., Luhmann, S.J., Mao, J., Gunn, J.D., & Luhmann, J.D. (2013)	Splinting vs casting satisfaction, convenience, and preference in children with distal radial buckle fractures	Randomized controlled trial of 94 children. Splint group showed higher levels of satisfaction, preference, and convenience on a 10-point scale.
Mobarakeh, M.K., Nemati, A., Noktesanj, R., Fallahi, A., & Safari, S. (2013)	Splinting vs casting of torus fractures of distal forearm	Randomized controlled trial of 142 patients. No significant difference in pain or compliance with splint vs cast.
Neal, E. (2014)	Splinting vs casting of distal forearm buckle fracture	Meta-analysis of 18 studies. Cost reduced with splint, patients preferred splint, and pain was the same with splinting or casting.
Williams, B.A., Alvarado, C.A., Montoya-Williams, D.C., Matthias, R.C., & Blakemore, L.C. (2018)	Splint vs casting of distal forearm buckle fractures	Retrospective cohort study of 240 patients showed that splinting reduced cost, reduced follow-up visits, and shortened encounter time.

Theory

The Iowa Model Revised: Evidence-Based Practice to Promote Excellence in Health Care



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Measures

- Prefabricated splint utilization rate: Percentage of patients meeting inclusion criteria who receive prefabricated splint.
- Orthopedics, emergency department and primary care provider follow-up rate: Percentage of patients meeting inclusion criteria who follow up within one month.
- Repeat immobilization rate: Percentage of patients meeting inclusion criteria who have repeat immobilization within a month.
- Repeat imaging rate: Percentage of patients meeting inclusion criteria who receive repeat radiographs (or other imaging).

Intervention

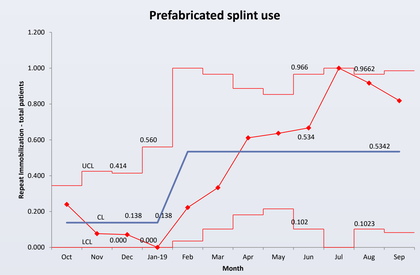
- Develop new clinical practice guideline and process design flow chart.
- Provide education for emergency department staff on best practice for distal forearm buckle fractures.
- Apply prefabricated wrist splint to patients with distal forearm buckle fractures with no routine follow up or repeat imaging.
- Educate patients and family on aftercare.

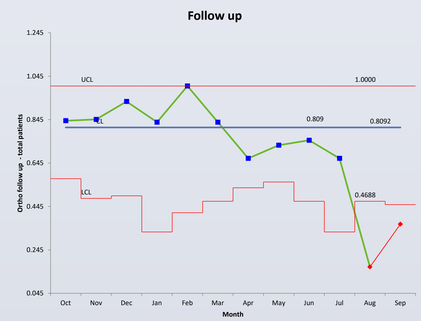
Implementation

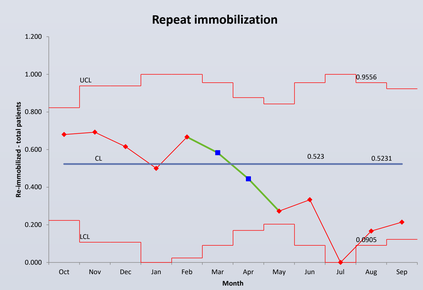
- Procure and store prefabricated wrist splints.
- Educate providers on new clinical practice guideline.
- Educate emergency department technicians in application of prefabricated splint.
- Create and distribute standardized discharge instructions for patients who meet inclusion criteria.

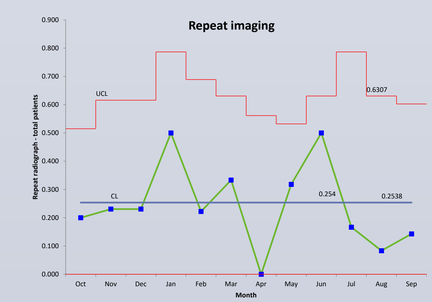
Results

	Pre-implementation (%)	Post-implementation (%)
Emergency department prefabricated wrist splint use	35	81
Orthopedics, emergency department, or primary care follow up	81	45
Repeat immobilization	52	14
Repeat radiograph	25	14









CL, centerline; LCL, lower control limit; UCL, upper control limit

Discussion

- All staff were supportive of the new clinical practice guideline. All noncompliance was due to forgetting about the new guideline or discharge instructions per staff.
- Emergency department staff reported only positive reactions to this new guideline from patients and families.
- No adverse events as a result of this guideline were identified during one-month post emergency department visit chart review.

Significance to Nursing Practice

- This project is an example of how nurses can identify a problem, examine data, collaborate with other health care professionals, and create change that benefits hospitals and patients.

Conclusion and Future Considerations

- Results show that a clinical practice guideline outlining best practice for distal forearm buckle fracture in children, along with relevant education, can reduce unnecessary follow up, repeat immobilization, and repeat imaging.
- Project has not ended. Team will continue to meet and evaluate data. Staff will continue to be reminded of clinical practice guideline to continue improvement.
- Further research is underway to calculate cost savings.
- Length of stay in the emergency department was calculated. Average length of stay post-implementation decreased by 42 minutes, though further research will be done to adjust for seasonal volume changes.

Contact Information

Robert Day
1600 Rockland Road
Wilmington, DE 19803
Bobhd04@gmail.com

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References available upon request