



## Variation Among Pediatric Hand Orthopaedic Surgeons When Diagnosing and Treating Distal Radius Fractures

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### INTRODUCTION

- Distal radius fractures are the most common injury in the pediatric and adolescent population
- A recent study found poor agreement among pediatric orthopaedic surgeons when diagnosing and treating these fractures. [1]
- The purpose of this study was to determine whether variation exists among pediatric hand surgeons when diagnosing and treating distal radius fractures.

### MATERIALS & METHODS

- 10 hand surgeons reviewed 100 sets of posteroanterior and lateral pediatric wrist radiographs. (Figure)
- Surgeons completed a questionnaire describing the fractures, the type of treatment they would recommend and the recommended length of immobilization.
- Additionally, the surgeons were queried when the next follow-up visit would be scheduled for, and whether or not they would obtain new radiographs at the subsequent and final follow-up visits.
- Kappa statistics were performed. Strength of agreement was determined based on guidelines outlined by **Landis and Koch**.

### RESULTS

- **Fair** agreement was present when diagnosing and classifying distal radius fractures as torus, greenstick, Salter-Harris II, and extra-physeal fractures (**K = 0.312**). (Table)
- There was **slight** agreement regarding the type of immobilization (**K = .242**) and length of immobilization (**K = .187**).
- **Slight agreement** was present regarding when the first follow-up visit should occur (**K = .188**). **Fair agreement** regarding whether or not new radiographs should be obtained at the first follow-up visit (**K = .396**), and if radiographs were necessary at the final follow-up visit (**K = .368**).
- Surgeons had **slight agreement** regarding the stability of the fracture (**K = .139**).

**Table:** Agreement among the 10 surgeons when reviewing 100 sets of pediatric wrist radiographs

Survey Question	Fleiss K	P-value	Level of Agreement
Diagnosis	0.312	<0.001	Fair
Treatment type	0.242	<0.001	Fair
Length of Immobilization	0.187	<0.001	Slight
Follow-up	0.188	<0.001	Slight
New radiographs	0.396	<0.001	Fair
Repeat imaging at final follow-up	0.368	<0.001	Fair
Fracture Stability	0.139	<0.001	Slight

**Figure:** Example PA/Lateral pediatric wrist radiograph with significant variation in classification and treatment



### DISCUSSION

- Pediatric hand surgeons when diagnosing and treating pediatric distal radius fractures showed only **fair agreement**.
- **When compared to pediatric orthopaedic surgeons of varied training backgrounds, there was better agreement among pediatric hand surgeons in practice habits.**
- Variation can possibly be attributed to differences in surgical and fellowship training, years in clinical practice, or legal implications.
- **As evidenced by this study**, standardization is required to better treat distal radius fractures in the pediatric population.

### CONCLUSION

- There is no standardization regarding how to treat and manage these fractures to ensure proper healing while minimizing the length of immobilization.
- Better classification schemes and treatment algorithms are needed for pediatric/adolescent distal radius fractures.

### REFERENCES

- [1] Dua K, Stein MK, O' Hara NN, Brighton BK, Hennrikus WH, Herman MJ, Lawrence TJ, Mehlman CT, Otsuka NY, Shrader MW, Smith BG, Sponseller PD, Abzug JM. Variation Among Pediatric Orthopaedic Surgeons When Treating and Diagnosing Pediatric and Adolescent Distal Radius Fractures. J Pediatr Orthop. 2017;e1-8.