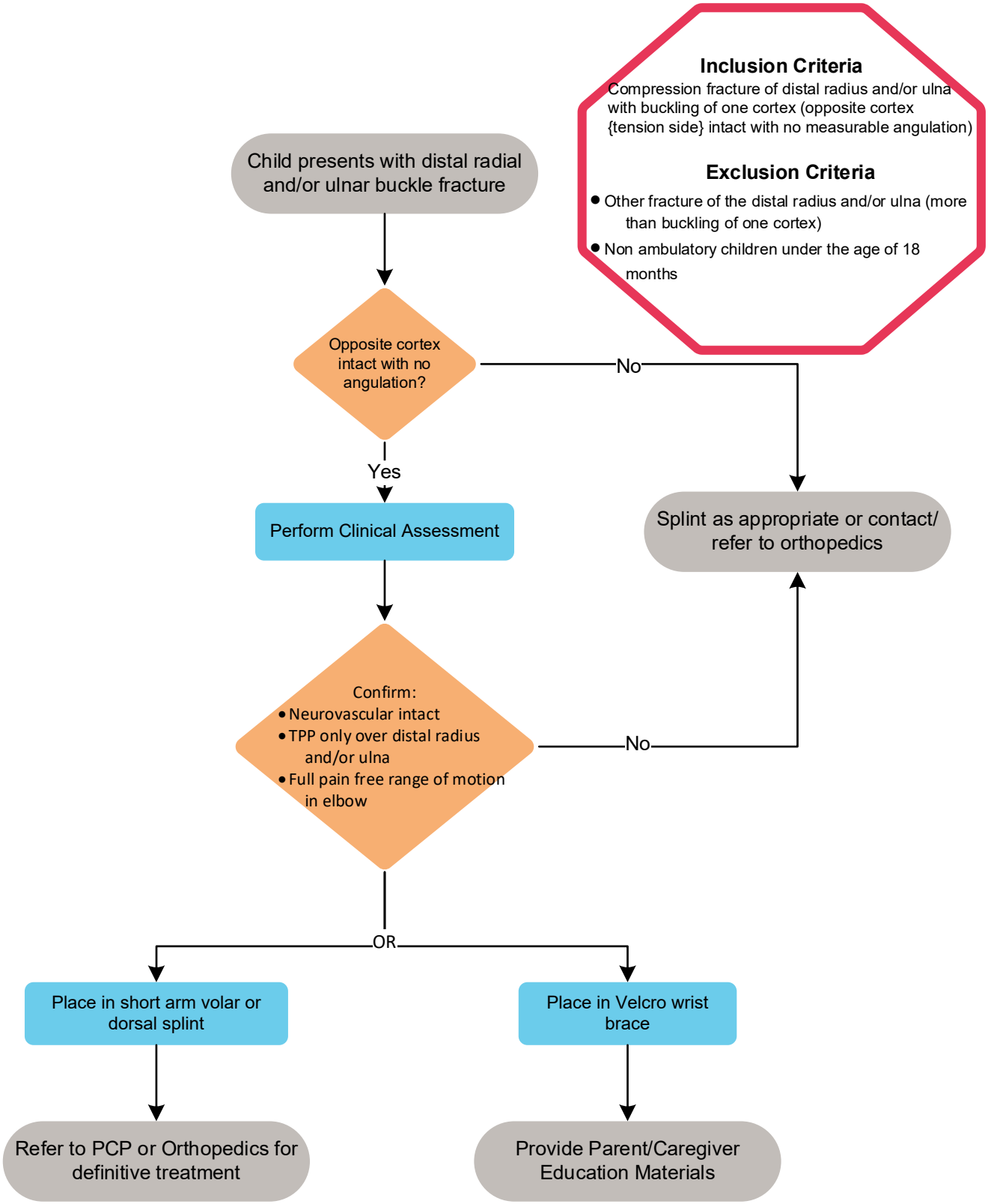
# BUCKLE FRACTURE

## Algorithm



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# TARGET POPULATION

## Inclusion Criteria

- Patients with a compression fracture of the distal radius and/or ulna with buckling of one cortex (opposite cortex {tension side} intact with no measurable angulation)

## Exclusion Criteria

- Other fracture of the distal radius and/or ulna (more than buckling of one cortex)
- Non ambulatory children under the age of 18 months

# CLINICAL MANAGEMENT

Prevention of swelling and pain

- Ice
- Elevation
- Oral over-the-counter (OTC) pain medication
- Monitor effectiveness of pain control measures

# TELEPHONE TRIAGE

- Fractures of the distal radius and/or ulna should be seen by the PCP or Orthopedic Clinic within 5 to 7 days to confirm fracture type and provide appropriate management
- Advise parent or caregiver to continue with ice, elevation and oral pain medications
- Provide parent or caregiver education regarding reasons to seek ED treatments, including neurovascular compromise and pain control

# CLINICAL ASSESSMENT

- Assess for vascular injury and neurological deficit

- Assessment of pain using strategies appropriate to the age/development level of the patient
- Obtain true anterior/posterior (A/P) and lateral wrist or forearm radiographs, if not already available
- Assessment for other injuries

## IMAGING

- Anterior/posterior (A/P) and lateral wrist or forearm radiographs, if not already available
- Evaluate for true buckle versus incomplete fracture
  - Buckling of one cortex with opposite cortex (tension side) intact[1]
  - No measurable angulation present

## THERAPEUTICS

- Pain control
  - Use OTC pain medications (ibuprofen or acetaminophen) as recommended by manufacturer's labeling.

## IMMOBILIZATION[3-5]

- Placement of short plaster or fiberglass volar or dorsal splint depending on location of fracture buckling for support and protection or placement of sugar tong splint if patient is in significant pain. This splint is not considered definitive treatment and should be replaced by PCP or orthopedics in the first week after fracture with a soft cast or Velcro brace.
- Placement of removable Velcro® brace with metal support, if available, may be definitive treatment. Velcro brace should be worn during the daytime for 3 to 4 weeks. May wean out of brace at night as tolerated.
- Brace may be removed for supervised bath.
- Brace should be worn for 3-4 weeks, if there is tenderness to palpation over the fracture site at 3-4 weeks post injury, continue brace wear an additional two weeks. If tenderness persists, continue brace wear and see PCP or orthopedics for follow up x-rays.
- A short-arm cast with semi-rigid casting tape for younger children (with whom compliance in a brace is questionable) is appropriate and avoids use of a cast saw for removal
- Patients experiencing significant pain may be treated in a short arm cast for 3 to 4 weeks
- For questions regarding the best course of treatment, please call Orthopedics (Anschutz campus specific) at 720-777-3153

## PATIENT | CAREGIVER EDUCATION

The Patient/caregiver should be given instruction regarding:

- How to evaluate neurovascular status
- Appropriate pain control measures
- Return precautions
- Splint/cast care

### Patient | Caregiver Education Materials

- Buckle Fracture

## FOLLOW-UP

- If patient was not casted and is pain-free with full range of motion after 4 to 5 weeks, the patient should follow-up on an as-needed basis
- If a cast has been placed, the patient should return to the provider that placed the cast in the timeframe recommended by the provider

## REFERENCES

1. Randsborg PH, Sivertsen EA. Classification of distal radius fractures in children: good inter- and intraobserver reliability, which improves with clinical experience. BMC Musculoskelet Disord 2012;13:6.

2. Kennedy SA, Slobogean GP, Mulpuri K. Does degree of immobilization influence refracture rate in the forearm buckle fracture? J Pediatr Orthop B 2010;19:77-81.

3. Plint AC, Perry JJ, Correll R, Gaboury I, Lawton L. A randomized, controlled trial of removable splinting versus casting for wrist buckle fractures in children. Pediatrics 2006;117:691-7.

4. West S, Andrews J, Bebbington A, Ennis O, Alderman P. Buckle fractures of the distal radius are safely treated in a soft bandage: a randomized prospective trial of bandage versus plaster cast. J Pediatr Orthop 2005;25:322-5.

5. Williams KG, Smith G, Luhmann SJ, Mao J, Gunn JD, 3rd, Luhmann JD. A randomized controlled trial of cast versus splint for distal radial buckle fracture: an evaluation of satisfaction, convenience, and preference. Pediatr Emerg Care 2013;29:555-9.

6. Randsborg PH, Sivertsen EA. Distal radius fractures in children: substantial difference in stability between buckle and greenstick fractures. Acta Orthop 2009;80:585-9.

## CLINICAL IMPROVEMENT TEAM MEMBERS

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## APPROVED BY

Clinical Pathways and Measures Review Committee – June 14, 2021
Pharmacy and Therapeutics Committee- not applicable

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| **MANUAL/DEPARTMENT** | Clinical Pathways/Quality |
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| **COLORADO SPRINGS REVIEW BY** |  Michael DiStefano, MD<br>Chief Medical Officer, Colorado Springs |
| **APPROVED BY** |  Lalit Bajaj, MD, MPH<br>Medical Director, Clinical Effectiveness |

## REVIEW/REVISION SCHEDULE

Scheduled for full review on June 14, 2025





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