

## Distal Radius Fracture Reduction Algorithm; Pediatric and Adult

### Supplies You Need:

1. Finger traps
2. Coban or foam tape
3. 5-10 lbs. counter weight (5 lbs. in kids, 10 lbs. in large patients)
4. 4 in. or 6 in. stockinette to hang weight from arm
5. 1 small Chloraprep stick
6. 20mL syringe
7. 21 gauge x 1.5 in. needle
8. 20mL 0.25% Marcaine withOUT epinephrine (**For children** dose is 1ml/Kg of 0.25% & you will also need conscious sedation typically)
9. Bandaid
10. 4 in. plaster (8-12 layers thick depending on age and size of patient; 8 for kids & 3 in. wide for smaller arms, 4 in. for larger kids. Avoid overlap on the ulnar and radial sides)
11. 3 rolls of 4 in. Webril, 1 roll of 3 in. Webril
12. One 3 in. and one 4 in. Ace bandage

Steps:

1. \*Obtain and document a complete neurovascular exam of the injured hand, wrist, and elbow PRIOR to reduction. This should include median, radial, ulnar nerve function as well as AIN, PIN and a radial and ulnar pulse and capillary refill, as well as compartment exam. **(Exams are harder on kids; just document what you saw!)**



Step 1

2. Lay patient nearly flat and slide them up to the edge of the gurney so their shoulder is in line with side of mattress.



Step 2

3. Place finger traps on thumb, index, and long finger for most fractures (usually radially displaced). If directly dorsal, use index, long, ring fingers. No need to trap all 5 fingers. **\*Pediatric & geriatric patients** with thin skin will benefit from Coban or foam tape around the fingers so that the traps don't rip their skin.

4. Hang patient in traps with bed height adjusted so elbow is bent 90 degrees and upper arm is straight out from torso.



Steps 3 and 4

5. Weight should be placed in or hung (using a hook) from stockinette placed around upper arm as high above elbow as you can get it, to stay out of way of splint.

NOTE: \*Pediatric patients done with sedation may NOT benefit from traction if the fracture is a greenstick type without shortening (steps 5-8).



Step 5

6. Palpate dorsal wrist to feel step off at fracture site, mark the site with the tip of a pen, usually in between 3rd and 4th compartments.

7. Prep dorsal wrist with chloraprep.



Steps 6 and 7

8. Place needle into fracture site by aiming slightly distally and walking along the dorsal cortical bone until you fall into the fracture site. There should be some blush of fracture hematoma back into syringe.

9. Inject 5-10mL of local to provide local analgesia.



Steps 8 and 9

10. Allow patient to hang in finger traps for 15-20 minutes until wrist deformity has corrected; this makes the reduction much less difficult and less painful for the patient.



Step 10

11. Measure out length of plaster so that it will stop at distal palmar crease on volar side and proximal to the MCPs dorsally. Allow an extra inch of plaster because it will shrink once wet.
12. Fill bucket with lukewarm water. Use cold water if it will be a difficult reduction because this can buy you more time. Avoid hot water.
13. Ensure that patient is relatively comfortable and appears in better alignment than on presentation.
14. \*Have fluoroscopy (mini C-arm) available for pediatric reductions or repeat attempts at reduction for adults.
15. Wrap patient in Webril, 4 layers at the ends of the splint: hand and upper arm, 2 layers thick along forearm. Add 3-4 layers of extra padding on the posterior elbow. **Do NOT place much padding in antecubital fossa.**
16. Letting the thumb out of the finger traps makes it much easier to wrap the hand/wrist.



Steps 15 and 16

17. Complete your reduction. **KEEP PATIENT IN FINGER TRAPS UNTIL PLASTER IS COMPLETELY SET.**



Step 17

18. Dip plaster in water and place on forearm from volar MCPs down around elbow and back up to dorsal MCPs as a standard “sugartong” splint.

19. Overwrap with one layer of webril and then wrap with Ace bandages; 3 in. around hand, 4 in. up past elbow.

20. For standard dorsally displaced/angulated Colles fractures place one hand above fracture on dorsum of carpus, place other hand on volar forearm just proximal to fracture site. Place foot on bottom of stretcher with knee propped against dorsal elbow as a third point of fixation. Hands/knee should be in the opposite locations for volarly displaced/angulated fractures.

**\*\*\* Most important molds: ulnarly deviate wrist, straight ulnar border and interosseous mold. For colles- flexion at fx site. Not excessive flexion which compromises median nerve.**



Step 20

21. Hold this position until plaster is **HARD**. Letting up too early is a common mistake and allows the fracture to re-displace.

22. Once splint is set, order portable XRs and go tell the XR tech to come shoot them as soon as possible. If this can be done shortly, leave the patient in the finger traps for the XRs to ensure that the plaster is truly dry. If XRs cannot be done immediately, let the patient out of the traps so their fingers do not get ischemic.

23. Check post reduction XRs, with goal of restoring volar tilt primarily, as well as radial height and radial inclination. If these are grossly unacceptable, the reduction will need to be redone.

24. \*Obtain and document a complete neurovascular exam of the injured hand/wrist **AFTER** reduction as well.

#### Other Pointers:

\* **Pediatric patients should all have a sling and told to wear it at all times (but bathing) to prevent splint from shifting. They should be told to keep splint clean and dry. Patients should be seen in one week for X-Rays in splint in clinic.**

\* Adult patients with dorsal angulation  $>20$  degrees, significant dorsal comminution, shortening  $>5$ mm will likely require surgery in the future because of re-displacement within the first few days/weeks. If your reduction is not perfect, it is fine because it will probably need to be fixed. Partial articular fractures and Chauffer fractures have very vertical fracture lines and are almost impossible to keep reduced in a splint. Be sure to review pre- and post-reduction XR's with your Chief Resident prior to sending a patient home.

\* Always aim for perfect reductions in children and people who may not end up needing surgery if the reduction is excellent.