



ORTHOPEDICS & SPORTS MEDICINE BAYCARE CLINIC®

Dr. Brian Klika & Dr. Andrew Kirkpatrick Metacarpal Fracture with CRPP

Phase 1 - Early Protective Phase (0 weeks-2 or 3 weeks)

Goals for Phase 1

- Protect healing fracture and surgical fixation
- Reduce pain & edema
- Promote motion in pain-free range

Other Considerations

- If multiple digits are involved, it may be appropriate to immobilize all digits

Orthosis

- Forearm-based ulnar or radial gutter orthosis fabricated to immobilize desired metacarpal in intrinsic plus position:
 - Wrist: 20-30° of extension
 - MP joints: 70° flexion
 - IP joints: Full extension
- Orthosis should incorporate injured metacarpal as well as one adjacent finger on both radial and ulnar sides of injured finger
- The orthosis is fabricated over the pin so there is no pressure on the pin, or a window is cut for the pin and covered with Velcro or gauze piece for protection
- IP joints may be kept out of orthosis to promote free IP motion per MD request and if there is no evidence of PIP joint extensor lag

ROM to begin unless MD orders or progress notes state otherwise

- 1-week: Initiate gentle active-assistive motion in a short arc of motion to MP, PIP and DIP joints. All motion should be pain-free and only to soft tissue restriction. Range of motion at this time is to prevent tendon adhesions and joint contractures while protecting the fracture pinning
- Initiate ROM to wrist and uninvolved digits to prevent stiffness

Pin Care

- Clean skin around pin site with sterile cotton swab and saline water
- Clean pin post with alcohol swab if able
- Instruct patient to perform pin care every 8 hours if there is drainage and daily if there is no drainage
- **See Pin Site Care Post-Operative Instructions**

Edema Management

- Edema glove or compression sleeves can be applied to hand and digits as needed to reduce swelling
- Soft tissue massage and manual edema mobilization (MEM) administered as needed to reduce pain and decrease swelling respectively.



Phase 2 – Restore Full Range of Motion (2 or 3 weeks - 6 weeks)

Goals for Phase 2

- Initiate gentle range of motion while protecting healing fracture
- Continue to resolve pain and edema

Other Considerations

- To prevent pins from shifting, education is vital to prevent patient from being too aggressive when initiating exercises. Emphasis should be on gentle motion in pain-free range. For noncompliant patients, it may be necessary to perform the range of motion only in the clinic setting until pins are removed.
- It is always important to monitor for extensor lags when trying to achieve end-range motion. If an extensor lag develops, it is important to balance flexor and extensor musculature through exercises and splinting.

Orthosis

- **5-6 weeks after pin is removed and fracture stable:** Patient may begin to wean from orthosis decreasing 1-2 hours of wear time per day until discontinued completely.

ROM

- Continue active range of motion 4-5 times daily in pain-free range. Reduce frequency if pain or swelling increases.
- It is important to view the x-rays to know the severity and location of fracture before initiating end-range motion. Always check MD orders for variations in the protocol.
- Emphasis on isolated MP joint flexion with IP joints extended, tendon glides, digit ab/adduction and isolated EDC exercises

Scar and Edema Management

- Continue with Phase 1 manual edema mobilization, and soft tissue massage to reduce swelling and pain
- After pin removed and pin site fully healed initiate scar massage

Modalities

- Moist heat as needed to maximize motion
- After pin removal and pin site is fully healed: Paraffin bath and Fluidotherapy may be utilized to increase tissue elasticity to maximize motion and to desensitize incision site if hypersensitivity is present.



Phase 3 – Strengthening Phase (6-8+ weeks)

Goals for Phase 3

- Maximize ROM
- Initiate progressive strengthening
- Progress patient toward full functional use of the involved arm and work if appropriate.

Other Considerations

- Continue to monitor for extensor lags. If an extensor lag occurs that is $>15^\circ$, it is important to balance flexor and extensor musculature through exercises and splinting. A forearm-based MP extension orthosis worn at night may reduce the extensor lag. A relative motion orthosis with the affected digit in relative extension worn during the day may also help reduce extensor lag. Exercises should emphasize isolated EDC strengthening, composite digit extension and avoid end range passive MP flexion and aggressive grip strengthening.
- Patient may use gel gloves to improve comfort and absorb shock through the hand with activities like using tools that vibrate, racquet sports and bicycling

Orthosis

- 6 weeks: Patient may begin weaning from orthosis decreasing 1-2 hours of wear time per day until discontinued completely.
- 8 weeks: If needed, a static progressive or dynamic finger splint may be fabricated to obtain end-range motion if normal interventions are unsuccessful.

ROM

- Continue Phase 2 range of motion
- Gentle passive range of motion may be initiated to achieve full end range motion
- Isolated EDC exercises can be performed with IP joints taped or strapped in composite flexion

Continue scar and edema management as needed

Modalities

- Continue with modalities as needed from Phase 2

Strengthening

- 7-8 weeks: Gentle progressive strengthening can be initiated if fracture is healed, and exercises do not increase pain or swelling
- Begin with forearm, wrist and hand isometrics and progress to isotonic strengthening using free weights and resistive putty or hand exercisers and wrist/hand stabilization exercises

Functional Activity

- Slowly progress from light functional activities to normal work and home management tasks
- No weight bearing, sports or use of tools that vibrate until at least 8 weeks
- After 8 weeks the patient may return to weight bearing, sports and use of tools that vibrate

Work Conditioning

- After 8-10 weeks and with MD consent a comprehensive work conditioning program for patients with high demand/heavy manual labor occupations may be appropriate

This protocol was reviewed and updated by Brian Klika, MD, Andrew Kirkpatrick, MD, Lacey Jandrin, PA, Tiffany Terp, PA, and the Hand Therapy Committee on August 1, 2022.

References

1. Cannon, Nancy M. et. al. Diagnosis and Treatment Manual for Physicians and Therapists, 5th Ed. The Hand Rehabilitation Center of Indiana. Indianapolis, Indiana. 2021.
2. Skirven, T. M., Ostermans, A. L., Fedorczyk, J. M., & Amadio, P. C. (2011). *Rehabilitation of the Hand and Upper Extremity* (Vol. 1). Philadelphia, PA: Elsevier.