



ORTHOPEDICS & SPORTS MEDICINE

BAYCARE CLINIC®

Dr. Klika & Dr. Kirkpatrick Four Corner Fusion

Four corner fusion of the wrist is a procedure used to correct pain in the wrist from arthritis, ligamentous damage, carpal bone non-union or necrosis. This procedure involves removal of the scaphoid and fusion of the capitate, lunate, hamate, and triquetrum bones of the wrist. Approximately 50% of pre-operative motion is expected to be lost after surgery. While this is not ideal, this procedure resolves most of the pain that patients experience from an unstable wrist.

Phase 1- Early Protective Phase (0-6 weeks)

Goals for phase 1

- Immobilize wrist to ensure fusion is protected.
- Ensure patient is properly educated on importance of wound care and signs/symptoms of infection.
- Educate on importance of movement of the uninvolved joints
- Educate on use of modalities to alleviate pain and swelling

Other considerations

- Educate patient to return to clinic at any time for adjustments of orthosis if it is not supporting fusion.

Orthosis

- A forearm-based wrist control orthosis is fabricated to protect fusion at all times

Wound Care

- Keep incisions clean and dry
- Educate patient in sterile dressing changes as needed

Scar Management

- Begin scar massage no sooner than 2 days after suture removal after scar is fully closed with no scabbing present. Begin with light massage using lotion.
- Educate patient in scar management
- Apply scar remodeling products as needed

Edema Management

- Light compression with Coban or compression sleeves to digits, hand and forearm as needed
- Elevation
- Manual Edema Mobilization (MEM)

ROM

- A/PROM to digits, forearm, elbow, and shoulder with splint on as needed to prevent stiffness

Modalities

- Ice to reduce pain and inflammation as needed



Phase 2 – Movement Phase (weeks 6-10)

Goals for phase 2

- Initiate movement within patient tolerance to achieve end-range motion.
- Reduce scar tissue presence and effect on structures.
- Reduce pain with use of modalities.

Other considerations

- Total end-range motion recovery expected is 50% of pre-operative movement.
- Close contact with surgeon is imperative to ensure fusion is stable enough for ROM initiation. **Initiation of ROM is always dependent on quality of fusion.**
- Therapy approach should emphasize pain-free ROM and functional strength. Pushing through pain can be counterproductive. Educate patient in frequent pain-free stretching.

Orthosis

- 6 weeks: Continue wrist control orthosis at all times between exercises
- 8-10 weeks: Patient may begin to wean from orthosis depending on quality of fusion and comfort outside of splint. If pain increases, return to splint.

ROM

- Initiate A/AA/PROM in all planes for the forearm, wrist, and thumb within patient tolerance
- ROM exercises to be done for 10-minute sessions every 2 hours, or 4-5 times daily.
- Patient should return to splint between exercise sessions

Continue scar and edema management as needed

Modalities

- Use of ultrasound to reduce scar tissue and improve healing.
- Use of fluidotherapy for heat application and desensitization if necessary.
- Use of Paraffin wax to apply deep heat, relax tissues, and improve blood flow and movement.



Phase 3 – Strengthening Phase (weeks 10-12+)

Goals for phase 3

- Achieve end-range motion (50% of pre-operative motion).
- Maximize strength of wrist, thumb, and digits.
- Resolve pain to tolerable level
- Improve function of extremity and return to work if applicable.

Other considerations

- All ROM and strengthening should be within pain-free range. Any motion or strengthening that increases pain should be decreased or eliminated entirely.
- Fusion rates are variable and may require longer periods of time for some patients. Therefore, ROM and strength may take longer to return if fusion rates necessitate longer immobilization.

Orthosis

- Patient is usually weaned from splint by 10 weeks however may continue to need it for heavier work and functional tasks

ROM

- Continue with active and passive ROM until end-range is achieved.
- Dynamic splinting may be utilized to achieve end-range motion if significant stiffness is still experienced.

Manual Therapy

- Continue with scar massage to reduce effects of scar tissue on motion if necessary.
- Soft-tissue massage may be used to reduce pain and improve tissue healing.

Strengthening

- Progressive strengthening may be initiated for the forearm, wrist, and hand.
- Home exercise programs should be issued and may need to be continued after discharge to ensure maximal function returns.

Modalities

- Continue with modalities from Phase 2 to improve blood flow, scar mobility, and patient comfort as needed.

References

Cannon, Nancy M. et. al. Diagnosis and Treatment Manual for Physicians and Therapists, 4th Ed. The Hand Rehabilitation Center of Indiana. Indianapolis, Indiana. 2001.

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.

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