Brostrom Post-operative Protocol

I. Phase I: Recovery (weeks 0-8)

- Goals:
  1. Protect healing tissue
  2. Control and reduce inflammatory process
  3. Restore talocrural and midtarsal joint mobility (excluding inversion ROM until 12 weeks)
  4. Prevent disuse atrophy in uninvolved joints of involved limb
  5. Gait training with and without assistive devices
  6. Maintain cardiovascular health
- Immobilization Device:
  I. **Weeks 0-2**: Patient to remain in splint at all times in neutral ankle position
  II. **Weeks 2-4:** Patient is to remain in a neutral ankle boot
  III. **Weeks 4-6**: Transition to boot in neutral ankle position (to be worn during all weight-bearing activities)
  IV. **Weeks 6**-8: Wean out of boot into lace up ASO
- Weight Bearing Status:
  V. **Weeks 0-2:** Non-weight bearing in splint, using bilateral crutches
  VI. **Weeks 2-4:** Weight-bearing as tolerated in walking boot, weaning from crutches as tolerated
  VII. **Weeks 4-6**: Weight-bearing as tolerated in boot with all ADL's
  VIII. **Weeks 6-8**: Weight-bearing as tolerated in lace up ASO with all ADL's
- Exercises:

I. Weeks 0-4:

1. *ROM: No ankle or foot ROM. Hip and knee AROM only:*
   - Heel slides, prone knee flexion/extension
   - Hamstring, quadriceps and hip stretches
2. *Strengthening: Hip, knee and core strengthening only while in boot (BEGINNING after 2 weeks post op):*
   - Quad sets, straight leg raises, open chain knee extensions
   - Seated, standing, and/or prone hamstring curls (with resistance proximal to ankle): theraband or ankle weight resistance
   - Open-chain hip ABDuction, ADDuction, flexion, and extensions (4 way hip) with theraband or ankle weight resistance
   - Physioball bridging (ball proximal to ankle)

- Core stabilization in supine, prone or quadraped positions

3. *Cardiovascular activity:* UBE, begin light stationary bike in cast after 2 weeks (WBAT) – no standing on the pedals

II. Weeks 4-6:

1. *ROM*: *AROM and gentle AAROM into PF and DF, eversion*. **NO INVERSION**
    - Begin gentle stretches to calf/Achilles with belt/towel
    - Begin seated stretching to dorsal ankle muscles and toe flexors/extensors
2. *Strengthening*:
    - Begin CKC submaximal lower extremity strengthening **in boot**: leg press, wall squats, hooklying bridges (bilateral to unilateral), physioball/freemotion hamstring curls
    - Submaximal isometrics of lower leg muscles in neutral ankle position
    - Intrinsic foot strengthening: rock/marble pick ups, towel toe crunches, Pilates intrinsic foot exercises (excluding inversion motion)
    - Seated heel raises
3. *Manual therapy*: soft-tissue mobilization (edema control and restoring tissue flexibility), gentle talar joint posterior mobilizations for improve DF ROM **{NO distraction or anterior glides}**, midtarsal mobilizations with subtalar joint stabilized as needed.
4. *Cardiovascular Activity:* Stationary biking in boot with increasing resistance; no standing on the pedals

III. Weeks 6-8:

1. *ROM:* Continue *with PROM and AAROM as symptoms allow.* **NO INVERSION**
    - Begin standing calf stretching
2. *Strengthening:*
    - Begin proprioception exercises: unilateral balancing on solid ground with progression to sagittal plane instability only (i.e. tilt board)
    - Submaximal ankle strengthening through pain free ROM **(EXCEPT INVERSION)** using resistive bands
    - Intrinsic foot strengthening : add weightbearing with arch maintained cueing.
    - CKC lower extremity progression: lateral step downs (with focus on intrinsic strengthening by maintaining arch height), step ups, lunges, and hip strengthening (especially glute max and medius: glute wall push, band walking, hip abduction with theraband)

- Heel raise progression: submaximal strengthening on leg press (bilateral then unilateral with increasing ROM then increasing weight), then progress to standing bilateral, body weight raises, then off step. Then progress to unilateral, body weight raises on ground then off step.

3. *Manual therapy*: soft-tissue mobilization (restoring tissue flexibility); talar joint posterior mobilizations in OKC and CKC to normalize DF ROM for stair descent; midtarsal mobilizations with subtalar joint stabilized as needed.

4. *Cardiovascular Activity:* Stationary biking in ASO with increasing resistance – no standing on the pedals

- Icing and elevation to decrease swelling and pain: 3-4 times per day 15-20 minutes each time

II. Phase II: Rehabilitation (weeks 8-12)

- Goals:

1. Protect healing tissue (still protecting inversion)
2. Achieve full sagittal plane foot and ankle ROM
3. Develop ankle and foot base strength, static and dynamic proprioception in sagittal plane only
4. Jump deceleration/eccentric training for neuromuscular recruitment and control in order to advance to running at next phase
5. Normal movement patterns (gait, stairs)

- Boot/Device: Lace-up ASO with all ADL's

- Weight bearing status: Full weight bearing

- Exercises:

Weeks 8-12:

1. *Continue with A/PROM to ankle and foot (**NO INVERSION**)*

    - *Progress calf stretches as tolerated*

2. *Begin sub-maximal strengthening*:

    - Continue with resisted ankle open-chain exercises with resistive bands (avoiding inversion) and with intrinsic foot exercises.

    - Continue with heel raise progression

    - Lower extremity, CKC exercises: inverted BOSU ball squats (bilateral to unilateral), sport cord walkouts and backward walking, slide board hip abduction with resisted theraband

3. *Proprioception*:

    - Single limb standing progression to unstable surfaces **(sagittal plane instability only)** – tiltboard, *inverted BOSU*???

- Begin plyometric exercises: submaximal acceleration/deceleration jump training on shuttle beginning with bilateral jumps progressing to unilateral hops (primary focus on controlled heel descent with landing).

4. *Manual therapy:*
    - Continue with STM and talar posterior glides (OKC and CKC) and midtarsal glides as needed
5. *Cardiovascular Activity:* stationary biking with resistance (can begin interval training and/or standing on peddles), versi-climber, stairmaster, elliptical. Begin Alter G run progression: interval or distance training dependent on sport (field, court, and distance demands of sport).

III. Phase III: Restoration (weeks 12-16)

- Goals:
    1. Restore full ankle ROM in all planes
    2. Regain full LE and foot/ankle strength and endurance to at least 75% of uninvolved side.
    3. Progressive loading of lateral ankle soft tissue
    4. Return to all ADL's without pain
    5. Begin return to running protocol
- Boot/Device: Lace-up ASO with all ADL's
- Exercises:

I. Weeks 12-16:

1. *A/PROM in all directions as tolerated **(ADD INVERSION)***
2. *Functional strengthening with progression toward sport-specific movement patterns:*
    - Lower extremity strengthening in multi-planes (sagittal, coronal, and transverse): walking lunges with heel raises, lateral lunging, forward lunge onto BOSU ball, rebounder throws with trunk rotation
3. *Proprioception/Agilities: Sport-specific drills*
    - Single limb standing with introduction to frontal plane instability progressing toward multi-planar instability
    - Continue with acceleration/deceleration training progressing to standing bilateral box jumps with increasing height, hurdle jumps, and progression to jump downs. Then progress to unilateral jump up, jump down, and hurdle jumps. Can begin bilateral lateral hops and sidestepping over hurdles.
4. *Continue run progression once at 95% WB on AlterG without pain and equal heel raise height bilaterally achieved:*

- Progressing to normal treadmill running, then running outside on flat, even surfaces, and eventually to grass/turf if applicable (distance and intervals dependent on sport – field, court, or distance runner)
- Sub-maximal forward and backward accelerations/deceleration training at 50-75% speed
- No cutting activities

IV. Phase IV: Return to Play (weeks >16)

- Goals:
  1. Running/sprinting and jump training at least 90% intensity without symptoms
  2. Achieve functional LE and foot/ankle strength and endurance or at least 90% of uninvolved side.
  3. Introduce agility, cutting, and sport-specific drills
  4. Pass return to play testing
- Boot/Device: Lace-up ASO with all ADL's
- Exercises:
  5. **Weeks >16:**
     1. *Continue with strengthening with sport-specific movement patterns and equipment*
        - Combined motions: adding resistance, speed, and complexity of patterns
     2. *Running progression:*
        - Progressing from 75% to 100% speed, full body weight on sport specific surface
     3. *Proprioception/Agilities:*
        - Progress to forward and backward accelerations to 75 to 100% speed
        - Plyometrics: continue with bilateral progression to more combined movement patterns (sagittal to frontal plane without and then with rotation) to more continuous and quick strategies. Unilateral jumping add: forward, lateral, backward challenges with jump up, down, and hurdles. Progress by varying heights of boxes, unstable surfaces, and rotational patterns.
        - Add acceleration/deceleration training to lateral and diagonal shuffles (lateral line touches, cone- cutting drills) then to multi-directional patterns with sport-cord resistance and/or increasing speed/effort or adding ball, stick or other sport specific device
        - Agility: introduce box quick step-ups/toe-taps, ladder drills (icky shuffles, scissors, box shuffles, typewriter), cone drills (figure 8, carioca, grapevine, zig-zags, side shuffles) all beginning at 50% intensity, building up to 100%. Add more sport specific patterns with cones, hurdles, or lines dependent on sport.

4. *Return to field/court activities when functional testing criteria met*