POST-OPERATIVE FOOT AND ANKLE WITH HARDWARE GUIDELINES

The following Post-Operative Foot and Ankle with Hardware Guidelines were developed by HSS Rehabilitation. These surgeries are intended to correct biomechanical malalignment which lead to functional impairments. The primary intention is to return to full functional and recreational activities. Returning to impact activities is based on pre-surgical activity and surgeon clearance.

Progression is both criteria-based and patient specific. Phases and time frames are designed to give the clinician a general sense of progression. In cases of tendinous repair, progression will be dependent on adequate soft tissue healing time. The program should balance the aspects of tissue healing and appropriate interventions to maximize function.

The following considerations should be kept in mind:

- Partial weight bearing (PWB) progression increases approximately 25% of body weight per week.
- For patients with comorbidities such as diabetes, osteoporosis or high Body Mass Index (BMI), healing times and weight bearing (WB) progression may be delayed.
- Be mindful that concomitant surgeries such as ligament repairs or reconstructions may affect treatment choices and rate of progression.
- Monitor for plantar fasciitis and metatarsal head pain.
- Consider removable external shoe lift for the non-operative limb.

Follow physician modifications as prescribed.

POST-OPERATIVE FOOT AND ANKLE WITH HARDWARE GUIDELINES

Pre-Operative Phase

PRECAUTION EDUCATION

- Non-weight bearing (NWB) post-operatively with splint/boot
- Elevation of operated lower extremity (LE) 80%-90% of the time (follow MD guidelines)

ASSESSMENT

- Foot and Ankle Disability Index (FADI)
- Lower Extremity Functional Scale (LEFS)
- Numeric Pain Rating Scale (NPRS)
- Ankle active and passive range of motion (AROM, PROM)
- Upper extremity (UE) and LE strength screen
- UE and LE AROM screen
- Pre-operative function
- Safety with assistive devices (crutches, rolling walker, knee scooter)

TREATMENT RECOMMENDATIONS

- Familiarize with post-operative plan of care and set expectations
- Immediate post-operative support plan for return to work or school
- Safety and falls prevention education
- Home environment modification (e.g. access including bathroom, removal of throw rugs, taping of electrical cords on floors, lighting, grab bars)
- Education regarding modifications of activities of daily living (ADLs) (e.g., food preparation, groceries, shower chair or bench, cast cover for bathing, elevated toilet seat or commode)
- Gait and stair training with weighted boot and assistive devices (crutches, rolling walker, knee scooter)
- Knee scooter operation, transfers and turns
- Removable external shoe lift for non-operative foot
- Optional rental of wheelchair with elevating leg rests
- Education regarding pain management, edema control, wound care, weight bearing (WB) restrictions, and signs and symptoms of infection and deep vein thrombosis
- Proximal LE and core strengthening, UE strengthening as needed (e.g., chair push-ups)

CRITERIA FOR ADVANCEMENT

- Patient able to verbalize post-operative plan of care

EMPHASIZE

- Familiarity with post-operative plan of care and expectations
- Preparation for NWB post-operatively
- Patient safety and falls prevention

MODIFICATIONS TO PRE-OPERATIVE PHASE

POST-OPERATIVE FOOT AND ANKLE WITH HARDWARE GUIDELINES

Acute Care Phase: Days 0-2

PRECAUTIONS

- Maintain NWB status
- Avoid having lower extremity in prolonged dependent position

CONSIDERATIONS

- LE must be elevated on at least two pillows for 80%-90% of the time (follow MD instructions)
- Keep knee extended when resting- pillows should be placed from calf down
- Walking is for functional home mobility and short distances only- wheelchair or knee scooter should be used for longer distances
- Non-removable splint must be kept dry at all times

ASSESSMENT

- Mental status (alert and oriented x 3)
- NPRS
- Activity Measure for Post-Acute Care (AM-PAC)
- Dressing check
- Swelling
- Post-anesthesia UE and LE sensory motor screening
- Functional status- bed mobility, transfers, ambulation, stair mobility if required

TREATMENT RECOMMENDATIONS

- Pain control education
- Transfer training: in and out of bed and sit to stand- chair, toilet
- Gait training with appropriate device on level surfaces while maintaining NWB status
- Stair training if required NWB with crutch and rail or seated bump up method
- ADL training and home modifications
- Cryotherapy for pain control over soft portion of splint and/or proximally
- Elevation of LE to prevent swelling (educate patient in “toes above nose”)
- Promotion of knee extension while elevated
- Therapeutic exercise with focus on maintaining non-operative LE and bilateral UE motion, flexibility and strength
- Active range of motion, self-mobilization (with MD approval)

CRITERIA FOR ADVANCEMENT

- Understanding of elevation protocol and other precautions
- Good pain control
- Safe ambulation NWB with appropriate device on level surfaces independently or with assistance of family member/friend if consistently present at home
- Safe stair negotiation if required while maintaining NWB status independently or with assistance of family member/friend if consistently present at home
- Independent with transfers
- Discharge home within 1-2 days when goals have been achieved and with MD clearance
- Note that acute care phase protocol is maintained for approximately 4 weeks (until patient is cleared by MD to begin outpatient physical therapy)

EMPHASIZE

- Control swelling
- Elevation protocol
- Independent transfers
- Gait training NWB
- Safe stair mobility if required

MODIFICATIONS TO ACUTE CARE PHASE

POST-OPERATIVE FOOT AND ANKLE WITH HARDWARE GUIDELINES

Post-Operative Phase 1: Weeks 4-8*

PRECAUTIONS

- Refrain from mobilizing fused joints.
  *** Note that for calcaneal osteotomy, phase 1 is typically delayed until weeks 6-8.**

ASSESSMENT

- FADI
- LEFS
- NPRS
- Wound status
- Edema
- Screen for deep vein thrombosis
- Sensory screen
- LE AROM/PROM and flexibility focusing on ankles and hips
- Ankle joint mobility
  - Talocrural joint
  - Distal tibiofibular joint
  - Subtalar joint
- Foot joint mobility
  - Metatarsophalangeal joints (MTPJ's)
  - Lesser digits as long as no pin through the joint
  - Unfused midfoot joints
- Soft tissue extensibility
  - Flexor hallucis longus (FHL) and flexor digitorum longus (FDL) tendons
  - Long toe extensors
  - Soleus
- Palpation focusing on hypertonicity of surrounding muscles
- Strength- Manual muscle testing (MMT) focusing on ankles/hips
- Gait and stair training PWB with crutches

TREATMENT RECOMMENDATIONS

- Scar mobilization, silicone strips, moisturizing when wound is healed
- Joint mobilizations with focus on talocrural and tibiofibular joints when wound is closed
- Progressive gait and stair training
- Ankle and toe A/PROM
    - Focus on seated and closed chain motion
- Progress to standing flexibility exercises respecting WB status
    - Runner's gastrocnemius stretch with rear LE within WB restrictions when 25% WB
    - Progress to toe articulation (push off motion with rear foot)
    - Progress to soleus stretch when 50% WB
    - Long toe flexor stretch against wall
    - Bilateral mini-squats when 50% WB
- Progress hip flexibility with emphasis on extension
- Initiate balance/proprioception exercise training respecting WB status
    - Multidirectional wobble board
    - Weight shifting (use scale to assess load)
    - Tandem stance when 75% WB
- Strengthening
    - Proximal LE
    - Bilateral heel raise progression: seated, seated with load, leg press, standing with upper body support, standing unsupported
    - Intrinsics
        - Arch doming progressing from seated to standing
        - Marble pick ups
- Bike when 50% WB
- Aquatic exercise if accessible when incision healed and cleared by MD
- Desensitization
    - Progressive touch/stroking of the foot
    - Ball massage on sole of foot
- When incisions are fully healed, consider:
    - Contrast baths
    - Compression garments

CRITERIA FOR ADVANCEMENT

- Stable/controlled swelling
- Wound closure
- Bilateral standing heel raises
- Full weight bearing (FWB) in from controlled ankle motion (CAM) boot with or without assistive device

EMPHASIZE

- Gait training with gradual progression of WB
- LE ROM and flexibility exercises emphasizing ankle and hip while respecting WB and wound status
- Progression to closed chain exercises
- Continuous monitoring of swelling

MODIFICATIONS TO PHASE 1

Bunionectomy

- Avoid tarsometatarsal (TMT) mobilization if fused.
- Treatment recommendations to consider: aggressive PF/DF mobilization to 1st MTPJ, FHL stretching

Flat Foot Deformity Correction

- Avoid mobilizing subtalar joint if calcaneal osteotomy.
- Treatment recommendations to consider: 1st ray plantarflexion control before heel raise

Ankle Fracture

- Confirm presence of syndesmotic screw. Avoid mobilizing distal tibiofemoral joint if present.
- Treatment recommendations to consider: aggressive posterior glide of talocrural joint

Sesamoiditis

- Assess and treat if plantar pain under 1st MTPJ.
- Treatment recommendations to consider: stretching and release of FHL tendon with mobilization to sesamoids as tolerated

POST-OPERATIVE FOOT AND ANKLE WITH HARDWARE GUIDELINES

Post-Operative Phase 2: Weeks 9-12

PRECAUTIONS

- Avoid weaning off assistive device and CAM boot when excessive pain or compensatory movements persist

ASSESSMENT

- FADI
- LEFS
- NPRS
- Wound/scar status
- Edema
- Open and closed chain ankle/hallux AROM/PROM
- Ankle, mid-foot and metatarsophalangeal (MTP) joint mobility
- Functional strength of LE
- Movement strategies for squats and stairs
- Single leg stance (SLS) with assessment of foot tripod (calcaneus, 1st and 5th metatarsal heads)
- Gait quality FWB without assistive device
    - With and without CAM as indicated

CONSIDERATIONS

Bunionectomy

- Focus on improving rollover

Flat Foot Deformity Correction

- Focus on maintenance of tripod during loading responses -> mid-stance

Ankle Fracture

- Optimize mid to late stance phase of gait cycle

TREATMENT RECOMMENDATIONS

- Patient education on appropriate footwear
    - Consider supportive sneakers, foam padding, taping, rocker bottom shoe if difficulty with rollover/push off phase of gait
- Gait training weaning from CAM boot and assistive device
    - Encourage step through pattern

- Edema management
    - Compression garments
    - Patient education on edema management
- Forward step up/down progression
- AROM/PROM and mobilizations of ankle and toes
    - Half-kneel, step stretching, flat footed squat with knees over toes and UE support, squat on toes
    - Mobilization of 1st MTP, talocrural and subtalar joints
    - Lunging with elastic band or strap for talocrural self-mobilization
    - Foam roller to anterior tibialis and distal tibiofibular joint
        - Calves
- Progress unilateral static and dynamic standing balance/proprioceptive exercises
    - Unstable surfaces e.g. foam, rocker board
    - Single leg activities with attention to equal weight bearing on 3 points of foot tripod
- Strengthening
    - Progress from bilateral to unilateral standing exercises, e.g. heel raises with proper eccentric control
    - Progress to dynamic, closed chain proximal LE strengthening
- Progress cardiovascular conditioning
    - Elliptical (forward and backward)
    - Encourage gym program
    - Retro treadmill
- If pain or gait deviations are persistent consider aquatic exercises or antigravity treadmill (if available)
- Scar mobilization, silicone strips, moisturizing when wound is healed

CRITERIA FOR ADVANCEMENT

- Functional Ankle/toe ROM to allow for symmetrical gait
- Community ambulation FWB without CAM boot and assistive device as appropriate
- Ascend/descend 6-inch steps reciprocally (timeline may differ for ankle fracture)

EMPHASIZE

- Wean from crutches to cane/no assistive device and CAM boot to supportive shoe
- Functional mobility of ankle and 1st MTPJ dorsiflexion in weightbearing

MODIFICATIONS TO PHASE 2

POST-OPERATIVE FOOT AND ANKLE WITH HARDWARE GUIDELINES

Post-Operative Phase 3: Weeks 13-18

PRECAUTIONS

- Premature progression to impact activities, e.g., running, jumping

ASSESSMENT

- FADI
- LEFS
- NPRS
- Scar status
- Swelling
- Open and closed chain ankle AROM/PROM
- Ankle, mid-foot and MTP joint mobility
- Kinetic chain potential distal effects on foot/ankle alignment, e.g., hip version
    - Premorbid compensatory patterning
- Functional strength of LE
- Squats and stairs
- Single leg stance SLS with assessment of foot tripod (calcaneus, 1st and 5th metatarsal heads)
- Single leg squat
- Star Excursion Test (see reference #2)
- Gait quality FWB without assistive device

TREATMENT RECOMMENDATIONS

- Patient education on alternative footwear options
- Edema control with a bimalleolar compression device or other compression garments
- Maximize gait symmetry, efficiency and speed e.g. stride length, cadence, push off, trunk rotation
- Forward step down progression
- A/PROM and mobilization focusing on persistent deficits
    - Sitting on dorsum of feet for PF ROM
    - Progress lower extremity flexibility with emphasis on hip extension
- Progress single leg closed chain activities, e.g. single leg squat, loaded forward lunge

- Progress dynamic balance/proprioceptive and loading exercises
    - E.g., cariocas, tandem walking, heel walking, toe walking, single leg balance with multidirectional challenges
    - Progress to unstable surfaces and perturbations
- Continue to progress functional strengthening
    - Maximize symmetrical movement patterns and encourage healthy compensatory patterns in adjacent joints as necessary
- Consider starting pre-impact training (e.g. aquatic/anti-gravity treadmill)
    - Eccentric strengthening and control
    - Functional lower extremity chain strengthening
    - Hiking, yoga, Pilates, light aerobic classes

CRITERIA FOR DISCHARGE

- Full ankle and hallux ROM (ankle fracture may not achieve full sagittal plane ROM with syndesmotic screw; bunionectomy may not regain full hallux extension ROM)
- At least 90% heel rise strength compared to contralateral side
- SLS ≥ 90% of uninvolved side with minimal foot, hip or core strategies
- Ability to appropriately progress to loaded activities
- Independent management of residual symptoms
- Independent home exercise program

EMPHASIZE

- Symmetry and efficiency in gait cycle without assistive device
- Dynamic stability
- Maximizing ankle dorsiflexion and plantarflexion ROM

MODIFICATIONS TO PHASE 3

POST-OPERATIVE FOOT AND ANKLE WITH HARDWARE GUIDELINES

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