Rehabilitation guidelines for patients undergoing subtalar and hindfoot fusion

At the RNOH, our emphasis is patient specific, which encourages recognition of those who may progress slower than others. We also want to encourage clinical reasoning.

Milestone driven
These are milestone driven guidelines designed to provide an equitable rehabilitation service to all our patients. They will also limit unnecessary visits to the outpatient clinic at RNOH by helping the patient and therapist to identify which specialist review is required.

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Indications for surgery
Pain and decreased function not responsive to conservative treatment. Causes include post-traumatic osteoarthritis, fracture, primary osteoarthritis or rheumatoid arthritis, failed ankle joint replacement, systemic joint disease, idiopathic arthritis and foot deformity secondary to neuromuscular conditions.

Possible complications:
- Infection
- Wound healing problems
- Persistent swelling
- Loosening/subsidence/migration of components
- Impingement
- Bleeding
- Nerve damage
- Deep vein thrombosis
- Pulmonary embolism
- Non-union
- Persistent/recurrent pain
- Fracture of bone/components
- Tendon injuries
- Contractures
- Complex regional pain syndrome
- If failure, may require subsequent revision fusion or extended fusion surgery
Surgical techniques
Subtalar fusion involves arthrodesis of the talocalcaneal joint. Hindfoot fusion via the triple arthrodesis technique consists of surgical fusion of the talocalcaneal, talonavicular and calcaneocuboid joint through three large cannulated screws or staples.

The surgery may also include one or more of the following, depending on the clinical presentation of the patient:

- Tendo-Achilles lengthening
- Calcaneal osteotomy
- Tendon transfers
- Ligament reconstruction
- Other osteotomies

Expected outcome:

- Improved pain relief
- Improved function/mobility
- Increased walking tolerance with decreased walking aid requirement
- Return to no impact/low-impact physical activities may be possible but strenuous sport unlikely
- Full recovery may take up to twelve to eighteen months

Pre-operatively
When indicated through pre-admission clinic or on admission to the ward the patient will be seen pre-operatively, and with consent, the following assessed:

- Current functional levels
- General health
- Social/work/ hobbies
- Functional range of movement
- Gait/mobility, including walking aids and orthoses
- Post-operative expectations
- Patient information leaflet issued
- Post-operative management explained

Post-operatively
Always check the operation notes and the post-operative instructions. Discuss any deviation from routine guidelines with the team concerned. This is very important if the patient has had any additional techniques as well as subtalar or hindfoot fusion as post-operative restrictions may be different, particularly weight-bearing status and progressions.
Initial rehabilitation phase: 0 – 2 weeks

Goals:
- To be safe and independently mobile with appropriate walking aid, adhering to weight bearing status
- To understand self management/monitoring, e.g. skin sensation, colour, swelling, temperature, circulation

Restrictions:
- Non weight bearing (NWB) for 2 weeks in back slab or cast

Treatment:
- Likely to be in below knee fibreglass cast or backslab
- Pain-relief: ensure adequate analgesia
- Elevation: ensure elevating leg with foot higher than waist for 55 minutes of every hour initially
- Education: teach how to monitor sensation, colour, circulation, temperature, swelling, and advise what to do if concerned
- Mobility: ensure patient independent with transfers and mobility with appropriate walking aid, including stairs if necessary

On discharge from ward:
- Independent and safe mobilising, including stairs if appropriate with appropriate walking aid
- Independent with transfers
- Understanding of post-operative routine, self-management and monitoring

Milestones to progress to next phase:
- Safe and independently mobile with appropriate aid non weight bearing in back slab or cast
- Adequate analgesia
Sub-acute rehabilitation phase: 2 – 6 weeks

Goals:
- To be safe and independently mobile with appropriate walking aid, adhering to weight bearing status
- To understand self management/monitoring, e.g. skin sensation, colour, swelling, temperature, circulation
- To understand the post-operative plan e.g. pacing of activities, requirement for short-term lifestyle adaptations, limitation in indoor/outdoor mobility

Restrictions:
- Ensure that weight bearing restrictions are adhered to:
  - Subtalar: PWB dependent upon bone healing. Surgical team will advise when to progress WB. At the earliest this will be PWB in cast with flat shoe at 2 weeks. Otherwise continue NWB in cast until review in clinic at 6 weeks.
  - Triple arthrodesis: dependent upon bone healing and instructions from team, will normally continue NWB in cast for further 2-6 weeks.
  - If any other surgical technique used ensure you check any restrictions with team as these may differ from subtalar arthrodesis or triple arthrodesis alone

Treatment:
- Likely to be in below knee fibreglass cast
- Pain-relief: Ensure adequate analgesia
- Elevation: ensure elevating leg with foot higher than waist
- Education: teach how to monitor sensation, colour, circulation, temperature, swelling, and advise what to do if concerned
- Mobility: ensure patient independent with transfers and mobility, including stairs if necessary

Milestones to progress to next phase:
- Safe and independently mobile with appropriate aid NWB or PWB in cast and flat shoe as per post-operative instructions
- Team to refer to physiotherapy if required to review safety of mobility/use of walking aids
- Adequate analgesia
Recovery rehabilitation phase: 6 – 12 weeks

Goals:
- To be safe and independently mobile with appropriate walking aid, adhering to weight bearing status

Restrictions:
- Ensure that weight bearing restrictions are adhered to:
  - **Subtalar**: commence PWB in POP with flat shoe if not doing so already. Progress to FWB pneumatic walker when instructed by surgical team. This will be at earliest 6 weeks post-op FWB. (NB: not all patients will require an aircast boot)
  - **Triple arthrodesis**: commence PWB when instructed by team dependent on bone healing. At earliest this will be 6 weeks. Otherwise continue NWB in cast until 12 week clinic review.
- If sedentary employment, may be able to return to work from 6-12 weeks post-operatively, as long as provisions to elevate leg, and no complications

Treatment:
- **Pain relief**
- **Advice/education**
- **Mobility**: ensure safely and independently mobile with appropriate walking aid adhering to appropriate weight bearing restrictions.
- **Wean out of Aircast boot** if provided with one once advised to do so
- ** Provision of flat shoe** as appropriate, if patient unable to get into normal footwear
- **Swelling management**
- **Monitor** sensation, swelling, colour, temperature, circulation
- **Pacing advice** as appropriate

Milestones to progress to next phase:
- Independently mobilising with/without aircast boot +/- walking aid
- Team to refer to physiotherapy if required to review safety of mobility/use of walking aids, gait re-education on commencing FWB

Failure to meet milestones:
- Refer back to team/discuss with team
- Continue with out-patient physiotherapy if still progressing
Recovery rehabilitation phase: 3 months - 6 months

Goals:
• To be safe and independently mobile +/- appropriate walking aid, progressing to independently mobile unaided
• Wearing normal footwear
• Optimise normal movement

Restrictions:
• Ensure that weight bearing restrictions are adhered to:
  o **Subtalar**: continue FWB following removal of aircast
  o **Triple arthrodesis**: surgical team to decide when cast exchanged for Aircast FWB. This is usually at 12 weeks post-operatively

Treatment:
• Pain relief
• Advice/education
• Mobility: ensure safely and independently mobile. Progress off walking aids as able once FWB.
• **Wean out of Aircast boot** once advised to do so, and provide post-op flat shoe, if patient unable to get into normal footwear
• **Exercises:**
  o ROM exercises - specify AROM/AAROM/PROM
  o Strengthening exercises as appropriate
  o Core stability work
  o Balance / proprioception work once appropriate
  o Stretches of tight structures as appropriate (e.g. Achilles Tendon)
  o Review lower limb biomechanics. Address issues as appropriate.
• Gait re-education
• Manual techniques of soft tissues and non-fused joints if appropriate
• **Electrotherapy** if appropriate
• Orthotics if required via surgical team
• **Hydrotherapy** if appropriate

Milestones to progress to next phase:
• Independently mobile unaided
• Wearing normal footwear

Failure to meet milestones:
• Refer back to team / discuss with team
• Continue with out-patient physiotherapy if still progressing
Final rehabilitation phase: 6 months – 1 year

Goals:
- Return to gentle no-impact / low-impact sports
- Establish long term maintenance programme

Treatment:
- Mobility / function: Progression of mobility and function, increasing dynamic control with specific training to functional goals
- Gait re-education
- Exercises:
  - Progression of exercises including functional strengthening, balance and proprioception, core stability
- Swelling management
- Pacing advice
- Return to work advice

Milestones for discharge:
- Independently mobile unaided
- Appropriate patient-specific functional goals achieved, e.g. return to low/no impact activities and normal daily routines
- Independent with long term maintenance programme
Failure to progress

If a patient is failing to progress, then consider the following:

<table>
<thead>
<tr>
<th>Possible problem</th>
<th>Action</th>
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<tbody>
<tr>
<td>Swelling</td>
<td>Ensure elevating leg regularly</td>
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<td></td>
<td>Use ice as appropriate if normal skin sensation and no contraindications</td>
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<td>Decrease amount of time on feet</td>
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<td></td>
<td>Pacing</td>
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<td></td>
<td>Use walking aids</td>
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<td>Circulatory exercises</td>
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<td>If decreases overnight, monitor closely</td>
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<td></td>
<td>If does not decrease overnight, refer back to surgical team</td>
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<tr>
<td>Pain</td>
<td>Decrease activity</td>
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<td></td>
<td>Ensure adequate analgesia</td>
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<td></td>
<td>Elevate regularly</td>
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<td></td>
<td>Decrease weight bearing and use walking aids as appropriate</td>
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<td></td>
<td>Pacing</td>
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<td>If persists, refer back to surgical team</td>
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<td>Breakdown of wound e.g. inflammation, bleeding, infection</td>
<td>Refer to surgical team or to GP urgently</td>
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<td>Numbness/altered sensation</td>
<td>Review immediate post-operative status if possible</td>
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<td>Ensure swelling under control</td>
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<td>If new onset or increasing refer back to surgical team</td>
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<td>If static, monitor closely, but inform surgical team and refer back if deteriorates or if concerned</td>
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Summary of evidence for physiotherapy guidelines

A comprehensive literature search was carried out to identify research relating to surgery for hindfoot arthrodesis and subsequent rehabilitation. After reviewing the articles and information, the physiotherapy guidelines were produced on the best available evidence.


