Rehabilitation guidelines for patients undergoing surgery for Tibialis Posterior reconstruction

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.

**Team contact details**

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**Indications for surgery:**

- Generally for Stage II Tibialis Posterior Tendon Dysfunction (Occasionally for Type I or Type III)

**Possible complications:**

- Infection
- Bleeding
- Nerve damage
- Deep Vein Thrombosis
- Pulmonary Embolism
- Scarring
- Non-union
- Transfer failure
- Flat foot remains / recurs
- Persistent / Recurrent pain
- Subsequent fusion if failure

**Surgical techniques**

The technique(s) used will depend on the stage of the tibialis posterior tendon dysfunction, and the clinical presentation of the patient.

Surgery tends to include one or more of the following:

- Tendon reconstruction with Flexor Digitorum Longus (FDL) transfer, Flexor Hallucis Longus (FHL) transfer or Tibialis Anterior transfer (Cobb procedure)
- Calcaneal osteotomy
- Tendo-Achilles lengthening
- Spring ligament (Plantar calcaneonavicular ligament) repair
- Lateral column lengthening (eg, calcaneocuboid distraction)
Expected outcome:
- Improved function / mobility
- Improved pain relief, with decreased analgesic requirements
- Improved arch height and alignment
- Stop the progression of the deformity
- To be able to do single heel raise
- Muscle strength: inversion grade 4 or 5 on Oxford scale
- Return to low impact sports may be possible but strenuous sport unlikely
- Full recovery may take up to twelve months

Pre-operatively
When practical 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, orthoses, etc
- 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.
Initial rehabilitation phase
0-6 weeks

Goals:
- To be safely and independently mobile with appropriate walking aid, adhering to weight bearing status
- To be independent with home exercise programme as appropriate
- To understand self management / monitoring, e.g. skin sensation, colour, swelling, temperature, etc

Restrictions:
- Ensure that weight bearing restrictions are adhered to:
  - **Cobb Procedure:**
    - Non-Weight Bearing (NWB) in Plaster Of Paris (POP) in plantar-flexion / inversion for 6 weeks, with change of cast every 2 weeks to bring foot towards neutral.
    - Full Weight Bearing (FWB) at 6 weeks in POP if neutral, otherwise still NWB.
    - Out of POP at 8 weeks and referred to physiotherapy. FWB.
  - **Flexor Digitorum Longus Transfer:**
    - Non-Weight Bearing (NWB) in Plaster Of Paris (POP) for 4 weeks.
    - Full Weight Bearing (FWB) in POP at 4 weeks.
    - Out of POP at 6 weeks and referred to physiotherapy.

- Elevation
- If sedentary employment, may be able to return to work from 4 weeks post-operatively, as long as provisions to elevate leg, and no complications

Treatment:
- Likely to be in POP
- **Pain-relief:** Ensure adequate analgesia
- **Elevation:** ensure elevating leg with foot higher than waist
- **Exercises:** teach circulatory exercises
- **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

On discharge from ward:
- Independent and safe mobilising, including stairs if appropriate
- Independent with transfers
- Independent and safe with home exercise programme / monitoring

Milestones to progress to next phase:
- Out of POP. Team to refer to physiotherapy when appropriate (Cobb Procedure at 8 weeks post-operatively, FDL transfer at 6 weeks post-operatively.)
- Progression from NWB to FWB phase. Team to refer to physiotherapy if required to review safety of mobility / use of walking aids
- Adequate analgesia
Recovery rehabilitation phase
6 weeks – 12 weeks

Goals:
- To be independently mobile out of plaster shoe / aircast boot
- To achieve full range of movement
- Tendon transfer to be activating
- To optimise normal movement

Restrictions:
- Ensure adherence to weight bearing status.
- No strengthening against resistance until at least 3 months post-operatively
- Do not stretch transfer. It will naturally lengthen over a 6 month period

Treatment:
- Pain relief
- Advice / Education
- Posture advice / education
- Mobility: ensure safely and independently mobile adhering to appropriate weight bearing restrictions. Progress off walking aids as able once reaches FWB stage.
- Gait Re-education
- Wean out of aircast boot once advised to do so, and provision of plaster shoe as appropriate, if patient unable to get into normal footwear
- Exercises:
  - Passive range of movement (PROM)
  - Active assisted range of movement (AAROM)
  - Active range of movement (AROM)
  - Encourage isolation of transfer activation without overuse of other muscles. Biofeedback likely to be useful.
  - Strengthening exercises of other muscle groups as appropriate
  - Core stability work
  - Balance / proprioception work once appropriate
  - Stretches of tight structures as appropriate (e.g. Achilles Tendon), not of transfer.
  - Review lower limb biomechanics. Address issues as appropriate.
- Swelling Management
- Manual Therapy:
  - Soft tissue techniques as appropriate
  - Joint mobilisations as appropriate ensuring awareness of those which may be fused and therefore not appropriate to mobilise
- Monitor sensation, swelling, colour, temperature, etc
- Orthotics if required via surgical team
- Hydrotherapy if appropriate
- Pacing advice as appropriate
Milestones to progress to next phase:
  - Tendon transfer activating
  - Full range of movement
  - Mobilising out of aircast boot / plaster shoe
  - Neutral foot position when weight bearing / mobilising

Failure to meet milestones:
  - Refer back to team / Discuss with team
  - Continue with outpatient physiotherapy if still progressing
Intermediate rehabilitation phase
12 weeks – 6 months

Goals:
- Independently mobile unaided
- Optimise normal movement

Treatment:
Further progression of the above treatment:
- Pain relief
- Advice / Education
- Posture advice / education
- Mobility: Progression of mobility and function
- Gait Re-education
- Exercises:
  - Range of movement
  - Progress isolation of transfer activation without overuse of other muscles. **Biofeedback** likely to be useful.
  - Strengthening exercises as appropriate
  - Core stability work
  - Balance / proprioception work
  - Stretches of tight structures as appropriate (e.g. Achilles Tendon), **not of transfer**.
  - Review lower limb biomechanics. Address issues as appropriate.
- Swelling Management
- Manual Therapy:
  - Soft tissue techniques as appropriate
  - Joint mobilisations as appropriate ensuring awareness of those which may be fused and therefore not appropriate to mobilise
- Monitor sensation, swelling, colour, temperature, etc
- Orthotics if required via surgical team
- Hydrotherapy if appropriate
- Pacing advice as appropriate

Milestones to progress to next phase:
- Independently mobile unaided
- Transfer to be activating
- Adequate analgesia

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

Goals:
- Return to gentle low impact sports
- Good transfer activation with grade IV / V inversion strength
- To be able to do single heel raise
- 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 range of movement, strengthening, transfer activation, balance and proprioception, core stability
- **Swelling Management**
- **Manual Therapy:**
  - Soft tissue techniques as appropriate
  - Joint mobilisations as appropriate ensuring awareness of those which may be fused and therefore not appropriate to mobilise
- **Pacing advice**

Milestones for discharge:
- Independently mobile unaided
- Transfer to be activating with grade IV / V inversion strength
- Able to do single heel raise
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>Pacing</td>
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<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 or to GP</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>Decrease weight bearing and use walking aids as appropriate</td>
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<td>Pacing</td>
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<td>Modify exercise programme as appropriate</td>
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<td>If persists, refer back to surgical team or to GP</td>
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<td>Breakdown of wound e.g. inflammation, bleeding, infection</td>
<td>Refer to surgical team or to GP</td>
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<tr>
<td>Transfer not activating</td>
<td>Start working in NWB gravity eliminated position with AAROM and then build up as able</td>
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<tr>
<td></td>
<td>Biofeedback</td>
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<td></td>
<td>Ensure adequate analgesia as appropriate</td>
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<td>Ensure swelling under control as appropriate</td>
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<td>Ensure foot neutral when mobilising to avoid excessive shear. Consider orthotics referral via surgical team if unable to keep neutral</td>
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<td>Refer back to surgical team if no improvement</td>
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<tr>
<td>Numbness/altered sensation</td>
<td>Review immediate post-operative status if possible</td>
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<td></td>
<td>Ensure swelling under control</td>
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<td></td>
<td>If new onset or increasing refer back to surgical team or GP</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 tibialis posterior tendon dysfunction and subsequent rehabilitation. After reviewing the articles and information, the physiotherapy guidelines were produced on the best available evidence.
