Rehabilitation Guidelines for patients undergoing Peri-Acetabular Osteotomy

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<tr>
<td>Ratifying Body</td>
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</tr>
<tr>
<td>Related Documents</td>
<td>Physiotherapy rehabilitation guidelines</td>
</tr>
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Introductions and aims of guideline

Please note that this is advisory information only. Your experiences may differ from those described. All exercises must be demonstrated to a patient by a fully qualified physiotherapist. We cannot be held liable for the outcome of you undertaking any of the exercises shown here independently of direct supervision from the RNOH.

As a specialist orthopaedic hospital we recognise that our broad and often complex patient group needs an individualised rehabilitation approach. Our emphasis is on patient-specific rehabilitation, which encourages recognition of those patients who may progress slower than others. These rehabilitation guidelines are therefore ‘milestone driven’ and designed to provide an equitable rehabilitation service to all our patients. They will also limit unnecessary visits to the outpatient clinic at RNOHT by helping the patient and therapist to identify when specialist review is required.

1. Definitions

See Section 4

2. Duties and Responsibilities

This section N/A for this guideline

3. Body of guideline

Indications for Surgery

The main indication for a peri-acetabular osteotomy is developmental dysplasia of the hip, where the acetabulum is too shallow and does not provide adequate coverage for the femoral head.

Possible Complications

- Wound healing/infection
- Blood loss-requiring transfusion
- DVT/PE
- Delayed union or non-union
- Loosening of fixation
- Leg length discrepancy
- Neuropraxia/nerve damage
- Failure to relieve pain/symptoms
Surgical Techniques

A peri-acetabular osteotomy is performed around the affected acetabulum. The acetabulum is re-orientated to improve coverage for the femoral head. It is secured in place with two-three threaded pins until bony healing occurs.

Expected Outcome

- Functional outcome is heavily dependent upon the pre-operative condition of the hip joint, pre-existing damage and arthritis of the hip can have a significant negative affect.
- Pre and Post-operative rehabilitation is vital to ensure optimum functional outcome.
- May take 6 months-1 year to achieve optimal function.
- ROM at hip back to pre-operative level.
- Mobilises independently mobile, with no aids.
- The pins can be removed after approximately 6 months-1 year.
- Correction of the deformity and increased longevity of native hip.

Main muscles affected:

- Hip flexors
- External obliques
- Rectus abdominus
- Psoas and Iliacus
- Hip abductors due to pain inhibition and change of the line of pull of the muscles.
- Can see hypertrophy of TFL//Try to prevent this but ensuring glutes firing correctly.
- Quadriceps

Pre-operatively

The patient may be seen pre-operatively, and with consent, the following can be assessed:

- Current functional levels
- General Health
- Home situation – Stairs etc
- Social / Work / Hobbies
- Functional range of movement
- Balance / Proprioception
- Gait / mobility, including walking aids, orthoses
• Multidisciplinary approach
• Post-operative expectations, commitment to exercises and maintaining protocol.
• 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: In-patient Stay (Usually 4-6 days)

Goals

• Protect Osteotomy, screw fixation and acetabular position and maintain flat foot touch weight bearing up to 20kg.
• To be safely and independently mobile with appropriate walking aid/s, adhering to flat foot touch weight bearing up to 20kg.
• To be independent with home exercise programme and understand all precautions/restrictions.
• To understand self-management / monitoring and self-directed Physiotherapy.
• Maintaining ankle and knee range of movement and increasing hip range of movement in closed chain exercises-adhering to weight-bearing status (eg using sliders)
• Control inflammation and swelling.
• Minimise effects of restricted weight-bearing and immobilisation.

Restrictions

• If sedentary employment, may be able to return to work from 6 weeks post-operatively, as long as radiographs are satisfactory and no complications.
• Children may be able to return to school if adaptations are made possible with classrooms and mobility after approximately 4-6 weeks.
• No straight leg raise to be performed until after first post-operative outpatient clinic review with consultant team, due to the shearing forces through the pelvis.

Treatment

• Pain-relief: Ensure adequate analgesia prior to Physiotherapy.
• Advice / Education: Teach how to monitor sensation, colour, circulation, temperature, swelling, and advise on scar tissue expectations and advise what to do if concerned. Teach protection, rest, and elevation.
• Scar advice- Once wound is healed, and scabs have fallen off then gentle massage of the scar site is advised, both across the scar and up and down. This will help desensitise the scar and reduce any thickening of the scar tissue.
• **Swelling management** - After PAO, there is a variable amount of pain and swelling, often depending on how much surgery was done. This usually diminishes after several weeks. It is helpful to keep the leg elevated and to apply ice regularly.

• **Exercises:**

  - AROM exercises for hip

    Closed chain hip flexion (heel slides NO straight leg raise), supine hip abd/add, standing sliders hip abd and ext adhering to flat foot touch weight bearing up to 20kg.

  - **Gait re-education:** Ensure safely and independently flat foot touch weight bearing up to 20kg.

• **Knee/hip and ankle range of movement exercises**

• **Strengthening** - Maintain hip range of movement within restrictions.

  Commence isometric glutes, inner range quads (avoid long range quads for 3 weeks due to activation of rec fem and it having been reflected during surgery), closed chain standing foot sliding exercises, into flexion/ext/abd maintaining flat foot touch weight bearing up to 20kg.

• **Pacing advice** as appropriate.

• **Mobility:** Ensure patient is independent with transfers and mobility, including stairs if necessary.

**On discharge from the ward**

• Independent and safe mobilising with appropriate walking aid/s, including safety on stairs if appropriate.

• Independent and safe with home exercise programme.

• Maintaining hip/(knee and ankle range of movement.

• Independent with swelling management

• Ongoing out-patient physiotherapy arranged for within 2 weeks post op

**Initial rehabilitation phase post discharge from hospital-8 week review.**

**Goals**

• Maintain hip/knee and ankle range within restrictions.

• Regain muscle strength without use of resistance and ensure correct muscle patterning- watch for dominance of TFL and glute med insufficiency.

• Pain controlled.

• Ensure maintain flat foot touch weight bearing up to 20kg.
Restrictions

- If sedentary employment, may be able to return to work from 2-4 weeks post-operatively, as long as provisions are made to elevate leg, and no complications.
- Driving: Restricted from driving until 4-6 weeks post full weight bearing.
- Maintain partial weight-bearing status
- No straight leg raise until after 6 week review.

Complications:

- Wound infection.
- Nerve damage.
- DVT
- PE
- Non-union-rotation of osteotomy back to original position.

Treatment Options

- **Pain Relief**: Ensure adequate analgesia
- **Advice / Education**: Comprehensive education and instruction on restrictions and on carrying out activities of daily living to manage pain and swelling
- **Posture advice / education.**
- **Swelling management-.**
- **Gait re-education.**
- **Mobility**: Ensure safely and independently mobile with walking aid/s

**Exercises**: Example exercises

- Prone lying may be commenced from 2 weeks post operatively to encourage small stretch of anterior capsule and hip flexors.
- Trans abs activation to encourage improved core stability.
- Commence bent knee fall out once patient can activate trans abs.
- Can add exercise bike after 2 weeks with no resistance starting at 30-70 hip flexion, progressing to 0-70 degrees as tolerated, by week 4 able to do 20 mins.

**Strengthening-** Example exs

- Isometric glutes
- Can add long range quads from 3 weeks post op.
- Closed chain standing slider exercises into flexion/ext/abd maintain flat foot touch weight bearing up to 20kg
- **Hydrotherapy** if appropriate (available), once wounds healed. Start at chest height (equivalent to 20kg weight-bearing) walking in water, mini squats, heel raises, assisted hip flexion with float, pendulum with knees bent facing wall- to encourage stretching of obliques.
- **Pacing advice** as appropriate.
Main Issues:

- Pain
- Swelling
- Non-union
- Potential Hypertrophy of TFL
- If there is persistent fever, a sudden increase in pain or swelling, wound redness or oozing, heat around incision site, increasing numbness, calf pain/swelling, or shortness of breath the patient should be reviewed urgently by the medical team.

Milestones to progress to next phase

- At the first outpatient review the assessment will focus wound healing and evidence of bony healing at the osteotomy sites. Once radiographic evidence of bony union has been observed then the weight-bearing status can gradually be increased over the next 6 week period.
- No or minimal hip pain.

8-12 WEEKS POST-OPERATIVE REHABILITATION PHASE:

Goals

- Return to full weight bearing as per consultant guidelines.
- Commence loading programme

Restrictions

- Ensure patient follows consultant’s instructions on weight bearing status, if no complications and good consolidation at post-operative review then gradually increase weight-bearing to full weight bearing and wean crutches as able.
- Ensure Gluteus medius activating and patient not compensating with Tensor Fascia Lata on muscle patterning (such as side lying abd and single leg balance).
- Observe for glut med insufficiency on single leg balance// trunk sway over leg or Trendelenburg evident.
- No treadmill use until after 8 weeks
- No ballistic or forced stretching.

Treatment

- Pain Relief: Ensure adequate analgesia
• **Advice / Education**: Comprehensive education and instruction on restrictions and on carrying out activities of daily living to manage pain and swelling.

• **Posture advice / education.**

• **Swelling management.**

• **Mobility**: Ensure safely and independently mobile and wean from walking aid (if applicable).

• **Exercises**
  
  Example exercises: Cycling, Cross trainer, commence double leg loading as able, isometric glute med with belt- bridging and sit to stand.

• **Alter-G treadmill (if available)** –especially relevant at 25%-75% weight bearing as can start normalisation of loading tissues and bone at weight bearing status.

• **Balance / Proprioception**–as per weight bearing status, early proprioceptive work will encourage recruitment of deep stability system.

• **Strengthening** of muscles stabilising the knee, hip and ankle.
  
  ➢ Strengthening of other muscle groups as appropriate.

**Core stability and gluteal control work**

**Stretches** – maintain stretches as appropriate to ensure normal flexibility of hip flexors, obliques, quadriceps, hamstrings and calf muscles in weight bearing position.

• **Review lower limb biomechanics and kinetic chain**, addressing issues as appropriate.

• **Biofeedback** may be used if altered sequencing of muscles.

• **Manual therapy:**
  
  o Soft tissue techniques as appropriate.
  
  o Joint mobilisations as appropriate.

• **Hydrotherapy (if available)**- especially relevant at 25%-75% weight bearing as can start normalisation of loading tissues and bone at weight bearing status.

• **Pacing advice** as appropriate.

**Milestones to progress to next phase**

• Healing evident on x-rays (superior pubic ramus, ilium & ischium).

• Full, pain-free hip ROM

• No evidence of hip flexor inflammation/irritability.

• Good muscle patterning and recruitment of glute med with minimal TFL dominance.

• Pain free gait with correct patterning with/without aids.

• Hip flexion strength >70% of non-operated side.

• Hip add, abd, ext, IR, ER strength >80% of non-operated side.
12 WEEKS-6 MONTHS POST-OPERATIVE REHABILITATION PHASE:

GOALS

- Full pain-free ROM
- Increase loading of bilateral exercises in gym
- Increase volume of single leg loading
- Commence gentle running drills and plyometrics if comfortable from week 16-20.

- Return to normal function- ADL’s, return to work, driving, school etc.
- Advice and Education- on return to sport (expected from around 6 months post op) and normal function.
- Mobility- Independently mobile.
- Exercises: Can commence open chain work as long as correct muscle patterning occurring (monitor for TFL overload/hypertrophy). Progress to impact/plyometric based exercise when ready.
- Progress swimming as comfort allows
- Commence jogging and progress running distance
- Initiate sport-specific drills as appropriate
- Gradual return to sports participation
- Maintenance program for global strength and endurance

Milestones for discharge

- Good proprioceptive control dynamically with correct muscle patterning.
- Return to normal functional level.
- Achieved patient goals.

Failure to meet milestones

- Refer back to team / Discuss with team.
- Continue with outpatient physiotherapy if still progressing and appropriate goals.

Failure to progress

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

4. Monitoring and the effectiveness of this guideline

<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>
</tr>
<tr>
<td>Condition</td>
<td>Recommendation</td>
</tr>
<tr>
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<tr>
<td>Use ice as appropriate if normal skin sensation and no contraindications.</td>
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<tr>
<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>Modify exercise programme as appropriate.</td>
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<tr>
<td>If does not decrease over a few days, refer back to surgical team</td>
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<tr>
<td>Pain</td>
<td>Decrease activity.</td>
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<tr>
<td>Ensure adequate analgesia.</td>
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<td>Elevate regularly.</td>
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<td>Pacing discussion and modify exercise programme as appropriate. Should continue isometric work at all times.</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/CNS team.</td>
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<td>Deformity</td>
<td>Alert surgical team immediately</td>
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Appendix 1: Glossary of Terms

**ADLS:** Activities of daily living

**ABD:** Abduction

**ADD:** Adduction

**CNS:** Clinical Nurse Specialist

**ER:** External rotation

**EXT:** Extension

**FLEX:** Flexion
Summary of evidence for physiotherapy guidelines

A comprehensive literature search was carried out to identify research relating to rehabilitation following Peri-acetabular Osteotomy and hip pathology.

References:


Appendix 2: Privacy Impact Assessment and Equality Analysis

This guideline is available on request in large print and alternative languages. It is a manager’s responsibility to ensure employees are aware of these options.