

Physiotherapy Guidelines for Rehabilitation Following Periacetabular Osteotomy

Reference: 1996v1
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Purpose

These are guidelines to be used for rehabilitation following Periacetabular Osteotomy (PAO). They are intended to be used for guidance around progression of rehabilitation and individual patient progress and problems should be addressed appropriately. It is the clinician's responsibility to maintain clinical reasoning throughout the rehabilitation process and progression through each phase should be goal dependent, not time specific.

If any concerns speak with the Consultant Orthopaedic Surgeon or a member of the MSK Outpatient Physiotherapy team at Sheffield Children's Hospital.

Intended Audience

These guidelines are intended to be used by physiotherapists who are supervising the rehabilitation of children and young people following PAO surgery at Sheffield Children's Hospital.

Guidelines for rehabilitation following Periacetabular Osteotomy

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1. Introduction

These guidelines give the clinician supervising the rehabilitation of children and young people following PAO surgery goals and clinical markers they need to meet when looking to progress rehabilitation. The treatment is not prescriptive and allows for each individual therapist's clinical reasoning and exercise selection. Exercise ideas have been given as a guide only. The key element is the point for progression through the rehabilitation process.

2. Guideline Content

These guidelines should be followed alongside the clinician's clinical reasoning. The time scales stated are for guidance only and the patient should not be progressed to the next phase of rehabilitation until the progression goals have been achieved.

Early phase (approx weeks 0 – 6)

Touch weight bearing (TWB), or Non-weight bearing (NWB) if unable to comply with TWB

Goals:

To reduce pain at rest to 0/10

Eliminate swelling

Normalise gait with a walking aid

Precautions

Follow weight bearing guidance; do not progress until orthopaedic review.

Avoid walking to fatigue point

Avoid hip extension beyond neutral

Avoid open chain exercises with long levers (eg SLR, side lying hip abduction)

Treatment

Swelling management advice

Gait re-education with walking aid

Muscle recruitment - gluteus medius, quadriceps

Passive hip flexion and abduction – WITHIN comfortable range only

Exercise ideas:

Passive hip ROM -progress to active - flexion, abduction, extension (care to be taken not to over-work hip flexors)

Static glutes

Glute Bridge - initiation only, ensure recruiting gluteus medius and not TFL

Ankle pumps

Static quadriceps, inner range quadriceps, standing hamstring curls

Isometric hip abduction, adduction, hamstring and quadriceps

Progression goals

Normal gait with aid and no pain

Recruitment of gluteus medius in crook lying position

Strong static quadriceps contraction

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Before progressing weight bearing status and reducing walking aid use orthopaedic review is needed to confirm bony union (on xray).

Mid phase (approx weeks 6-12)

Progress weight bearing status and reduced walking aid use gradually over this phase.

Goals

Normalise gait without aid

No pain with ADLs

ROM to pre-operative/functional level

To be able to perform controlled step up/down

Precautions

Take care with repeated hip flexion movements – iliopsoas impingement on the site of the pubic osteotomy is common after PAO

Use walking aid until gait is non-antalgic

Treatment

ROM restoration

Strengthening of hip flexors, abductors, adductors, extensors, quadriceps, hamstrings, calf complex, and core

Exercise ideas:

Open chain – hip abduction, hip extension (to neutral only) in standing

Hip AROM – hip flexion in supine, prone windscreen wipers, clam (take care not to over recruit TFL), hip abduction in supine, marching in standing, hip flexion gym ball rolls, rocking in 4 point kneeling

Prone work – PKB (do not force a stretch), posterior pelvic tilt practice

Closed chain – squats, step up/down, mini lunge (progress depth as control and pain allows), heel raises.

Core work – early plank work, glute bridge (+/- ball squeeze for adductors), BNFO*, heel slides*.

Balance work – weight transference, single leg stand* (adhering to weight bearing status), wobble board*

Glute motor control work – hip dips for gluteus medius.

*ensure neutral pelvis and core control maintained throughout.

Cardiovascular exercise

Hydrotherapy

Gentle swimming (using a pool buoy initially), walking in the water (care to be taken entering/exiting pool)

LIGHT cycling – if no pain with repetitive hip flexion

Cross trainer – low resistance –if no pain with repetitive hip flexion (ensure adhering to weight-bearing guidance)

Progression goals

Normal gait unaided

Functional ROM

Hip flexor and quadriceps strength at 50% of contra lateral limb or greater

Up/down step control

Single leg stand for 15 seconds with pelvic control

Late stage rehab (approx 12 -16 weeks)

Goals

Full/functional ROM

Pain free ADLs

Increased core and lower limb strength

Precautions

No impact activities until at least 3 months post-surgery, confirmation of adequate bone healing (from X-ray at 12 week orthopaedic review) and demonstration of good hip and lower limb control.

Avoid end of range hip flexion if painful

Continue to have caution with repetitive hip flexion activities

Treatment

Progress to dynamic work (eg walking lunges)

Add in movement and resistance to earlier stage exercises (eg theraband, rotational lunge)

Focus on hip abduction strengthening (functional exercises and specifically targeting glutes eg side lying hip abduction)

Higher level balance and proprioception work

Start with impact work/jumping (2 feet to 2 and progressing through to hopping)

Progress glute work (eg monster walks, standing clam squats)

Progress core strengthening

Cardiovascular exercise

Swimming

Cycling

Cross trainer

Treadmill walking, progress to LIGHT Jogging – low impact, low intensity, with graded increase

Progression goals

Increased lower limb strength (90% of pre-surgery level)

Good pelvic control with single limb activities

Symmetry with high level single leg balance test (eg Y balance test)

End stage rehab (16 weeks plus)

Aims

Able to walk >1 mile without any limp

Return to sport – pass any appropriate sport specific functional tests

Exercises

High level balance and proprioception work

High level hip and core strengthening

Progress to plyometric exercises (eg jumping squats/lunges)

Stretching for muscle tightness as required

Sport specific drills

Cardiovascular exercise

Sport specific

Progression goals/discharge criteria

Pain free rehab

Pass functional testing for return to sport

Ongoing commitment to independent home exercise programme (as required)

3. References

- Adler KL, Cook PC, Geisler PR, Yen Y-M and Giordano BD. Current concepts in Hip Preservation Surgery: Part II - Rehabilitation, *Sports Health, a multidisciplinary approach*, 2016 Jan-Feb Volume 8(1): 57-64
- Ellman MB and Hugate R (2015) Panorama Hip Preservation Center Rehabilitation and Physical Therapy Protocol, Combined Hip Arthroscopy and Ganz Osteotomy - General Post-Operative PT Guidelines, [Internet]. Denver, Colorado: Panorama Orthopaedic and Spine Centre; 2015 [updated Feb 2015], Available from <https://www.panoramaortho.com/wp-content/uploads/2015/02/Combined-PAO-Hip-Arthroscopy-Postoperative-Physical-Therapy-Protocol.pdf> (accessed 17.04.20)
- Hip dysplasia physio, PAO rehab guidelines [Internet] London, UK, Hip Dysplasia Physio, 2018, Available from <https://hipdysplasiaphysio.com> (accessed 14.09.20)
- Ito, H., Tanino, H., Sate, S., Nishida, Y. and Matsuno, T. (2014) Early weight-bearing after PAO leads to high incidence of postoperative pelvic fracture, *BMC Musculoskeletal disorders*, [online] Volume 15: 234. Available at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4100493/> (Accessed 17.04.20)
- Malviya A, Dandachli W, Beech Z, Bankes MJ and Witt JD The incidence of stress fracture following peri-acetabular osteotomy, an under reported complication. *The Bone and Joint journal*, 2015 Jan; 97-B: 24-28
- UW Health Sports rehabilitation (2018) Rehabilitation guidelines for Periacetabular Osteotomy of the Hip [online]. Available at: https://www.uwhealth.org/files/uwhealth/docs/sportsmed/SM-174372_Hip_PAO_Rehab_final.pdf (Accessed 17.04.20)