

**PHYSIOTHERAPY PATHWAY  
WAHT-TP-011**

*This guidance does not override the individual responsibility of health professionals to make appropriate decision according to the circumstances of the individual patient in consultation with the patient and /or carer. Health care professionals must be prepared to justify any deviation from this guidance.*

**Post-operative Physiotherapy Pathway  
ACI, MACI and AMIC of the Knee**

<b>Owner:</b>	Benjamin Thomas Physiotherapy and Orthotics Manager
<b>Approved by</b>	Therapies Clinical Governance Group
<b>Approval Date</b>	11 <sup>th</sup> August 2023
<b>Review Date</b>	11 <sup>th</sup> August 2026 This is the most current document and should be used until a revised version is in place

**Key Amendments**

<b>Date</b>	<b>Amendments</b>	<b>Approved by:</b>
25 <sup>th</sup> January 2023	Document extended to 30 <sup>th</sup> June 2023 whilst under review.	Dr J Trevelyan/ Benjamin Thomas
23 <sup>rd</sup> June 2023	Document extended for another 3 months whilst under review.	Benjamin Thomas
11 <sup>th</sup> August 2023	Document approved for 3 years	Therapies Clinical Governance

**Therapist Information**

- Indications for surgery – chondral and osteochondral defects of the knee, osteochondritis dissecans (spontaneous loss of a fragment of cartilage or bone and cartilage without trauma).
- The implantation undertaken will either be to the femoral condyle or the trochlea. The rehab protocol varies according to the location of the chondral graft.
- Aims of physiotherapy:  
To facilitate a healing response without overloading the graft. The graft needs to be protected in the initial stages with a gradual increase in weight bearing status, ROM and return to function. The graft site is most vulnerable in the first 3 months and therefore needs protecting.  
To reduce pain and joint clicking/locking/ swelling instability. To improve function and mobility.
- Full recovery may take up to 12 months.
- There may be some deviations away from the routine protocol therefore the post op notes must be checked and any deviations discussed with the team involved.

**Surgical techniques:**

**ACI technique:** An open knee incision is required. A biopsy of non damaged articular cartilage is harvested following arthroscopy and cultured. The cartilage defect is prepared and a periosteal flap or a bilayer collagen membrane is sutured over the prepared cartilage defect. The cell suspension is injected underneath.

**MACI technique:** Non damaged articular cartilage cells are harvested and cultured following arthroscopy. A collagen membrane matrix seeded with the cultured autologous chondrocytes is used. This matrix is fixed with a fibrin sealant without sutures (occasionally sutures may be required). This can be performed via a mini-arthrotomy, a less invasive approach.

**AMIC technique:** This technique is similar to microfracture but it uses a collagen membrane to stabilise the microfracture clot, providing a more stable environment for new cartilage tissue formation. The membrane is attached with fibrin glue or sutures via an arthrotomy.

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**Physiotherapy Pathway for ACI, MACI and AMIC of the Knee****0 – 3 DAYS**

\*Keep all patients in extension for 1<sup>st</sup> week post op \*

**Trochlea grafts**

Weight bearing: FWB with elbow crutches as pain allows.

ROM: No ROM exercises until 1 week post op.

Hinge brace locked into extension when weight bearing for 4 weeks (can be Unlocked for exercise to 45 degrees after 1 week).

Strengthening: Static quadriceps/gluteals.  
Circulatory exercises.

**Femoral grafts**

Weight bearing: TWB for 4 weeks, progress to PWB for a further 2 weeks

ROM: No ROM exercises until 1 week post op

Hinge brace locked into extension when weight bearing for 1 week (unlocked to 45 Degrees after 1 week)

Strengthening: Static quadriceps/gluteals  
Circulatory exercises

**On discharge from the ward:**

- Independent and safe mobilising, including stairs if appropriate
- Independent and safe with home exercise programme

**WEEKS 1 – 6****Trochlea grafts**

Weight bearing: FWB with elbow crutches as pain allows. Progress off crutches as able.

ROM: Commence ROM exercises 0 – 45 degrees until week 4 (gradually progress after this)

Hinge brace locked into extension for 4 weeks when mobilising.

Strengthening: Closed chain AROM/AAROM knee flexion/extension in lying/sitting.  
Closed chain quadriceps within 0 – 45 degrees.  
Static quadriceps/gluteals.

- Postural advice
- Swelling management
- Gait re-education
- Stretch tight structures as appropriate

## PHYSIOTHERAPY PATHWAY

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#### Femoral grafts

Weight bearing: TWB for 4 weeks post op then PWB for a further 2 weeks.

ROM: Progress ROM gradually as pain allows aiming for full range at 6 weeks.

Can be weaned from the brace as control allows.

Strengthening: Closed chain AROM/AAROM knee flexion/extension in lying/sitting.

Open chain quadriceps if pain allows.

Closed chain quadriceps from 4 weeks (within range and W.B restrictions).

Static quadriceps/gluteals.

Low resistance isometric exercises.

Active exercises against gravity, low resistance.

- Patella mobilisations as appropriate
- Stationary cycling can be introduced from week 4 with minimal resistance as long as there is sufficient movement to complete a revolution without pain

#### Milestones to progress to next phase:

- Achieving stated range of movement
- Pain free exercises

## WEEKS 6 - 12

### Trochlea grafts

Weight bearing: Independent FWB

ROM: Gradually progress ROM, aiming for full active ROM by week 12.

Care with active range between 30 and 50 degrees flexion.

No limit to passive movement at week 6.

No limit to active movement by week 12.

Gradually wean off brace as control allows.

Strengthening: Controlled AROM exercises of the knee.

Resistance work with therabands/weights. Progress duration.

Progressive quadriceps work (mainly CKC. OKC between 0 – 30 and 50 – 90 Degrees).

- Balance/proprioception work
- Stretches as appropriate
- Core stability work

#### Femoral grafts

Weight bearing: FWB wean off elbow crutches as able

ROM: Full active ROM

Strengthening: Controlled AROM exercises of the knee

Resistance work with therabands/weights. Progress duration.

Progressive quadriceps work particularly CKC

- Balance/proprioception work
- Stretches as appropriate
- Core stability work

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**Milestones to progress to next phase:**

- Pain free exercises
- Mobilising independently
- Able to dynamically stabilise knee during single leg stand/squat (may take slightly longer with femoral condyles due to restricted weight bearing during first 6 weeks)

**DRIVING:** After 7 weeks if can perform an emergency stop.

**12 – 6 MONTHS****Trochlea and femoral grafts**

- Postural advice
- Gait re-education
- Progress balance/proprioception (static – dynamic)
- Gym work
- Strengthening exercises through range
- Introduction of sports specific rehab

**Milestones to progress to next phase:**

- Able to dynamically stabilise the knee and be independently functional in everyday activities.

**6 MONTHS – 1 YEAR**

- May commence sport specific training at 9 months and return to contact sport at 1 year
- Functional dynamic work (running/hopping/jumping)
- Return to low impact activities (light jogging)

**Milestones for discharge:**

- Good proprioceptive control dynamically
- Return to normal functional level
- Return to sports if set as patient goal