

## Knee microfracture repair post-operative protocol

Post-operative rehabilitation is an important factor in achieving a successful outcome from a microfracture procedure. A successful outcome and the time it takes to return to activity is dependent on the patient's age, patient's body mass, lesion size, duration of symptoms prior to surgery, presence of arthritis, previous surgery and post-operative rehabilitation program.

### Early phase rehabilitation (Post operation – 6 weeks)

**Appointments** – begin rehabilitation 2 days post op and continue with follow ups x1 per week.

#### **Rehabilitation goals**

- Protection of the post-surgical knee
- Restore normal ROM with correct patellar mobility
- Eliminate effusion at the knee
- Restore leg control

#### **Precautions**

- **IMPORTANT: Monitor wound**
  - If you have any concerns about your wound immediately contact us on:  
**OS group: 0203 397 7779**
  - This would include any of the below symptoms or observations;
    - wound leakage – blood or discharge
    - redness around the area
    - excessive or worsening pain
    - raised temperature
- **IMPORTANT: DVT awareness**

- If you have any concerns that you may have developed a DVT (deep vein thrombosis) immediately contact us on this number:
  - WARD (please insert):
  - OS group: 0203 397 7779
  
- This would include any of the below symptoms or observations;
  - sudden calf pain and swelling
  - pain, swelling and tenderness in one of your legs (usually your calf)
  - a heavy ache in the affected area.
  - warm skin in the area of the clot.
  - red skin, particularly at the back of your leg below the knee.
  - shortness of breath and chest pain (very rare)
  
- **Manage swelling**
  - Cryotherapy is advised
  - **PHYSIOLAB portable S1 device** is the preferred cryo-pneumatic device of OS group. See Appendix B for contact details.
  
- **Reduce mobility**
  - Rest as much as possible
  - Limited walking to around the house
  - If using crutches please see appendix A for instructions on advice on their use.

## **Weight bearing**

Use crutches with leg fixed in brace for 5-6 weeks

- Weeks 0-2 – Non weight bearing (NWB)
- Weeks 3-4 – Touch weight bearing
- Weeks 5-6 – Weight bearing as tolerated

## **Rehabilitation outline**

- ❖ Knee extensions on a bolster
- ❖ Prong hangs
- ❖ Supine wall slides as tolerable without pain
- ❖ PROM off the end of the table
- ❖ SLR
- ❖ Quad stets
- ❖ May begin walking in a pool at end of week 5 into week 6
- ❖ Cycling machine – use contralateral leg to create PROM for injured knee
- ❖ Exercises should be daily and high repetitions to promote the rebuilding of fibrocartilage within the knee

### **Progression criteria**

- ✓ 6 weeks post op
- ✓ No effusion
- ✓ Full ROM into knee extension
- ✓ Reduction in pain levels

### **Early – Mid phase of rehabilitation (after previous phase criteria is achieved 6weeks+)**

**Appointments** – Sessions should be once every 1-2 weeks based on client availability.

This phase of rehabilitation will cover from 6-12 weeks progressively loading in line with precautions until impact training can start at 12 weeks+.

### **Rehabilitation goals**

- Single leg stand control
- Normalize gait pattern
- Good control and no pain with movements such as step downs/up, squats + partial lunge (no knee flexion more than 60 degrees)

### **Precautions**

1. Avoid causing post activity swelling
2. No loading into deep knee flexion past 60 degrees
3. No impact training until 12 weeks post op

### **Rehabilitation outline**

- ❖ Non-impact balance drills
- ❖ Begin on proprioceptive drills in line with precautions
- ❖ Stationary bike and gait drills
- ❖ Hip and core strengthening
- ❖ Stretching for patient specific muscle imbalances
- ❖ Continuation of quad strengthening – closed chain (no more than 60 degrees FLX)
- ❖ Continue Pool work if available (swimming, deep water running)

### **Progression criteria**

- ✓ Normal gait on all surfaces
- ✓ Full ROM
- ✓ No effusion + post exercises
- ✓ Ability to carry out functional movements without unloading effected leg pain free while demonstrating good control
- ✓ Single leg balance greater than 15 second with good control and no compensatory movements

### **Late stage rehabilitation 3 months +**

**Appointments** – continue with appointments 1-2 every week based on client progression and availability

### **Rehabilitation goals**

- Good control of lower limb pain free
- Pain free sport/ work specific exercise

### **Precautions**

1. Post activity soreness should resolve within 24 hours of exercises
2. Avoid post activity swelling at the repaired knee
3. Avoid any amount of knee pain with impact training

### **Rehabilitation outline**

- ❖ Impact training exercises
- ❖ Begin with 2 feet to 2 feet – progressing from 1 foot to other followed by 1 foot to same foot

- ❖ Movement control exercises beginning with low velocity, single plane exercises and progression to multi-plane exercises with higher velocity
- ❖ Sport/work specific balance and proprioceptive drills
- ❖ Continuation and progression of hip and core strengthening
- ❖ Stretching for patient specific muscle imbalance if necessary
- ❖ Neuromuscular control work
- ❖ Forward and lateral step-ups  
2-4-6 inch and eccentric lateral step down on 2-4-6-inch step with control (watch for hip hike or excessive ankle dorsiflexion)
- ❖ Supine swiss ball with bridge + knee flexion progress to 1 leg (when tolerable with strength)
- ❖ Hamstring curls standing & sitting-weights/pulleys/bands
- ❖ Eccentric heel drops off step 2 progress to 1 leg
- ❖ Continue wobble boards and add basic upper body skills (i.e. throwing, catching)
- ❖ Single leg stance on unstable surface – mat, pillow, mini-tramp, BOSU

#### **Progression criteria**

- ✓ Good neuromuscular control in all multi plane activities
- ✓ no post exercise swelling
- ✓ post exercises soreness should resolve within 24 hours
- ✓ all activities and exercise must be pain free

#### **Additional progression 12 weeks +**

- Begin rehabilitation towards sports
- Full range isokinetic
- Knee extension machine with low weight high reps progressing isokinetic quads to full extension.
- Begin plyometric program
- Concentrate on agility training
- Begin to introduce gentle sport specific drills
- Return to recreational sports if full range of motion 150+degrees
- Hamstring strength superior to 90% of no injured
- Quads superior to 85% + agility training completed.
- Aim to delay contact sport for a further six weeks.
- Maintenance of HEP 2-3 times per week.

Suggested outcome measures tests to be used to monitor progression throughout the  
rehabilitation

**Bilateral Drop Jump Test**

- Participant stands on a 30cm box
- Jump two footed off the box landing with feet either side of a line 30cm from the box
- Immediately attempt to undertake a maximum vertical jump reaching up to touch a target held above the line
- Score a zero if the appropriate strategy is used and one for inappropriate movements. (Best overall score is 0 and worse is 10 points)

**Qualitative Analysis of Drop Jump Landing**

Date: \_\_\_\_\_ Patient: \_\_\_\_\_ Condition: \_\_\_\_\_

Left                  Right                  Bilateral

		Left	Right
<b>Trunk Alignment</b>	Leaning in any direction from midline		
<b>Foot on Landing</b>	Initial foot contact not symmetrical (timing)		
	Initial foot contact not symmetrical (foot landing away from mark)		
	Significant ground contact time		
	Foot not neutrally aligned (facing forwards)		
	Failure to land on mid foot		
<b>Limb on Landing</b>	Thigh pelvis angle <90deg		
	Stiff upright landing		
	Patella pointing towards 2 <sup>nd</sup> toe (noticeable valgus)		
	Patella pointing past inside of foot (significant valgus)		
	<b>Total</b>		

**Tuck Jump Test**

- Subjects stand in a 30cm box marked on floor
- Undertake tuck jump continuously for 10 seconds
- Must attempt to raise the knees above the hips each time and land and take off within the box
- Score a zero if the appropriate strategy is used and one for inappropriate movements. (Best overall score is 0 and worse is 10 points)

**Tuck Jump Test Score Sheet**

Date:

Patient:

Condition:

Left:

Right:

Bilateral:

	Score
<b>Knee and Thigh Motion</b>	
1. Knee valgus on landing	
2. Thighs not reaching parallel (peak of jump)	
3. Thighs not equal side to side (during flight)	
<b>Foot position during landing</b>	
4. Foot placement not shoulder width apart	
5. Foot placement not parallel (front to back)	
6. Foot contact timing not equal	
7. Does not land in same foot print	
8. Excessive landing contact noise	
<b>Plyometric technique</b>	
9. Pause between jumps	
10. Technique declines prior to 10 seconds	

Qualitative Analysis of Single Leg Loading

(Single leg squat)

(Single leg step down)

(Single leg hop for distance)

- See page 14 for test descriptions
- Score a zero if the appropriate strategy is used and one for inappropriate movements. (Best overall score is 0 and worse is 10 points)

Date:

Patient:

Condition:

Left

Right

Bilateral

QASLS		Left	Right
Arm strategy	Excessive arm movement to balance		
Trunk alignment	Leaning in any direction		
Pelvic plane	Loss of horizontal plane		
Thigh motion	WB thigh moves into hip adduction		
Knee position	Patella pointing towards 2 <sup>nd</sup> toe (noticeable valgus)		
	Patella pointing past inside of foot (significant valgus)		
Steady stance	Touches down with NWB foot		
	Stance leg wobbles noticeably		
	Total		



### Qualitative Analysis of Single Leg Loading - Test Descriptions

#### Single leg step down

- Participant stands on a 30cm box
- Instructed to step off the box onto a mark, 30cm from the box and 5cm on the contra-lateral side to the mid line

#### Single leg hop for distance

- Participant stands on mark at side of standard tape measure
- Hands resting on iliac crests
- Attempts to hop as far as possible staying parallel to the tape.

#### Cross Over Hop Test

- Subject stands by two parallel lines 20cm apart extending at least 5m
- Undertakes four consecutive hops without pause crossing the grid lines each time.

#### Star Excursion Balance Test

- Subject stands on leg to be tested in centre of star. Keep heel down.
- Instructed to reach as far as possible down the line without taking undue support from the reaching leg or stepping over onto that leg
- 4 practices then test 5 repetitions

#### General notes

- All landings for single leg step down and single leg hop for distance must be held for 3 seconds, emphasis during task instruction must be placed on this
- Evaluate all landings using the QASLS scoring system
- For single leg hop for distance also include the distance hopped and the leg length
- Position camera a minimum of 2m from the landing position, zoom in to maximise the size of the subject within the frame
- Allow the subject a minimum of two practice attempts (continuing until they are able to do tasks appropriately) then record a single attempt.

## **Appendix A - Crutches**

- When standing up and sitting down, make sure you take your arms out of the crutches and hold them in one hand. This will help to avoid any shoulder injuries.
- When walking with the crutches, keep the handles pointing forwards and your arms close to your sides.
- Place both crutches forwards together with enough space in between them to step into.
- If you are advised that you are not allowed to put any weight through your injured leg (non-weight bearing), place your crutches forwards together. Now lean through your arms as you hop your uninjured leg up to the same level as the crutches. The foot on your injured leg must stay off the floor at all times when walking.
- If you are advised that you are allowed to weight bear, place the crutches forwards together and then step your injured leg up to the crutches. Now lean through your arms as you step your uninjured leg forwards to the same level.
- When climbing stairs, try to use a banister or rail in one hand and a crutch in the other (you can also carry the extra crutch in this hand):
  - GOING UP: Good leg, bad leg, crutch
  - GOING DOWN: Crutch, bad leg, good leg.
- Check the rubber stoppers regularly. If they are worn down, bring them back to the Physiotherapist will replace them.

## **Appendix B - Physiolab**

Link for hire <https://physiolab.com/products/to-rent/s1-portable.html>

Website [www.physiolab.com](http://www.physiolab.com)