OS Clinic

Rehabilitation Protocol

Distal Femoral Osteotomy

A Distal Femoral Osteotomy (DFO) is a widely performed procedure to treat knee arthritis, ligamentous deficiency and joint instability.

Precautions:

- **IMPORTANT: Monitor wound**

If you have any concerns about your wound immediately contact us on:
OS Clinic: 0207 046 8000

  - This would include any of the symptoms or observations below:
    - 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 Clinic: 0207 046 8000**

  - This would include any of the symptoms or observations below:
    - 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 Clinic. See Appendix B for contact details.

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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.

Phase 1 - Post-operative phase (Surgery to 10 weeks)

Rehabilitation goals

- Control pain and edema
- Full knee extension
- Activate quadriceps strength
- Protection of healing tissues
- Restore knee flexion

Weight Bearing

- **10kg only for 10 weeks and 2 x crutches (see guidance in appendix A)**
- **After 10 weeks review by x-ray if approved then full weight bearing no crutches.**

Range of motion

- Week 1 0-90 degrees
- Week 2 0-110 degrees
- Week 3 0-120 degrees
- Week 4 progress to full ROM

Note: If brace is applied – (Brace to be worn and locked into full extension at all times other than one to one sessions and hygiene purposes. Alternate ranges and use to be advised by the consultant if differing from the above. Brace should be worn at nighttime)

Rehabilitation exercises

- **NOTE: NO STATIONARY BIKE FOR 6 WEEKS.**
- Range of motion exercises – full passive knee extension
- Patellar mobilizations
- Ankle pumps
- Core exercise
- Quadricep sets (neuromuscular electrical stimulation as appropriate, if difficulty with quad activation)
- Four-way SLR (AB and AD with brace to support)
- Hamstring, hip flexor, quad and calf stretching
- Cryotherapy with elevation for plan and inflammation 20mins several times per day

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Phase 2 (Weeks 10 – 14)

Criteria to progress to phase 2

- ✓ Minimal pain and swelling around the knee
- ✓ Must have full extension and improvement in degrees of knee flexion

Goals

- Progression of weight bearing
- Restore full range of motion
- Improvement of quadriceps strength and endurance

Weight bearing

- Refer to Phase 1
- 10kg for 10 weeks with 2x crutches then FWB no crutches.

Bracing *if applicable*

- Discontinue brace when patent has obtained good quadricep control
- Open brace to range of motion comfortable obtained by client
- Unlocked for gait (promote normalized gait)

Rehabilitation exercises

- Progression to stationary bike
- Four-way SLR without brace
- Initiate WB exercises if tolerable: (Weight shifts & mini squats)
- Core exercises progressions
- Balancing exercises
- Begin closed chain exercises
- Proprioception activities
- Pool work for gait re-education and training
- Continue cryotherapy management
- Isometric leg press

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Phase 3 – Progression of functional activity (Weeks 14 – 22)

Criteria to progress to phase 3

- ✓ Full range of motion at the knee
- ✓ Minimal pain and edema (pre/post exercise)
- ✓ Improving objective functional strength and endurance (norms data)

Goals

- Build and improve on functional activity
- Improve lower limb flexibility, strength and endurance

Rehabilitation Exercises

- Continue gradual progression of phase 2 exercises (core progression glutes, biking, iso leg press- leg press)
- Step ups
- Wall squats
- Lunges
- Lateral step downs
- Hamstring curls
- Lateral walks with resistance (banded)
- Walking program on treadmill (must have meet all criteria before walking program)
- Pool work gradual progression to swimming
- Terminal knee extensions
- Elliptical (week12/13 based on criteria)
- Long arc quads (90-40degrees)
- Advance bilateral and unilateral closed chain exercises with emphasis on concentric/eccentric control
- Progress balance activities

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Phase 4 – End stage, return to physical activity (5 – 8 months)

Criteria to progress to phase 4

- ✓ Full non painful range of motion
- ✓ Strength within 80% of contralateral side
- ✓ No pain inflammation or swelling
- ✓ Comfortable with proprioceptive exercise (objective)

Goals

- Gradual return to unrestricted functional activity
- Comfortable reproduce sport specific scenarios

Some sporting activities can be allowed at this stage, although based on the osteotomy healing and feedback with consultant allows.

- 4-6 months – Low impact sports such as swimming, golf, cycling
- 6-8 months – Higher impact sports such as running, jumping and aerobics
- 8-12 months – High impact sports can be introduced

Exercises

- Continuation of maintenance program 3-4 times per week
- Progress resistance training as tolerated
- Progress agility and balance drills
- Impact loading program should be specialized to the patients demands in line with their sports
- Program sports program depending on patient variables

Each of these sports should have a breakdown of gradual return to play based on needs analysis before engaging fully with the sport.

Return to sports

The return-to-play criteria should include a 3-tier system to allow the player to safely return to full sport physically and psychologically if sport is the level of activity they require to return to.

Return to participation – Modified sessions lower than the RTS level allowing the patient to regain fitness and psychological confidence in returning to training

Return to sport – The athlete has returned to sport but not at the required performance level progression and training adaptation to reach the same levels as preinjury fitness

Return to performance - Extending the RTS element the athlete has gradually returned to sport and is performing inline or above the pre-injury performance level.

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

Qualitative Analysis of Single Leg Loading

Single leg squat
Single leg step down
Single leg hop for distance

- See next page for test descriptions
- Score a zero if the appropriate strategy is used and one for inappropriate movements. (Best overall score is 0, 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 2nd toe (noticeable valgus)		
	Patella pointing past inside of foot (significant valgus)		
Steady stance	Touches down with NWB foot		
	Stance leg wobbles noticeably		
	Total:		

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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 midline

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.

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Appendix A: Use of 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 you 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 and the physiotherapist will replace them.

Appendix B: Physiolab

Link for hire:

https://physiolab.com/products/to-rent/s1-portable.html

Website:

www.physiolab.com