



MPFL Rehab Protocol

Rehabilitation after patella stabilisation surgery

Physiotherapy after kneecap surgery: the rehabilitation protocol following medial patellofemoral ligament (MPFL) reconstruction. Associate Professor Chinmay Gupte, PhD, FRCS (Tr & Orth). Version 2026. Last reviewed: [MONTH] 2026.

Rehabilitation after MPFL reconstruction runs in four phases, with straight line jogging from four months and return to sport usually between seven and nine months. You weight bear fully from the start. The brace opens in stages over the first six weeks, and the early work that matters most is switching the gluteal muscles and the inner range quadriceps back on.

What the operation does. The medial patellofemoral ligament is the main soft tissue restraint stopping the kneecap sliding towards the outside of the knee. Reconstructing it rebuilds that restraint with a graft. The staged brace settings in the first six weeks exist to protect the graft while it heals.

This protocol covers isolated MPFL reconstruction. If you also had a tibial tuberosity osteotomy, a trochleoplasty or a cartilage procedure, your weight bearing and progression will differ. [SEE COMBINED PROCEDURES BELOW.]

Physiotherapy after kneecap surgery: what to expect

Physio after kneecap surgery is the part that determines the result. The operation restores the restraint; rehabilitation restores the control that keeps the kneecap where the surgery put it.

Expect to start physiotherapy within the first week or two, and to keep going for the better part of a year. The early sessions are about swelling, full straightening, and waking up the gluteal muscles and the quadriceps. The middle phase is strength. The last phase is impact, agility and testing. You will be in a brace for the first four to six weeks, walking on the leg from day one.

Terminology varies, and all of these describe the same operation and the same protocol: patella stabilisation, patellar stabilisation, kneecap stabilisation, patella stabilization, and MPFL reconstruction. If you are being treated outside the UK, your physical therapist can work from this document as written.



Recovery timeline at a glance

Phase	Timing	Focus	Milestone to progress
1. Protection	0 to 6 weeks	Protect the graft, restore gluteal and inner range quadriceps function, staged range of movement	Flexion beyond 110 degrees, full extension, straight leg raise without lag, walking without crutches
2. Strengthening	6 to 12 weeks	Full range, progressive strength, swimming and cycling introduced	Full range of movement, quadriceps above 60% of the other side, normal gait
3. Advanced strengthening	12 to 16 weeks	Power, balance, early agility and plyometrics	Quadriceps above 80% and hop tests above 80% of the other side
4. Running and return to sport	4 months onwards	Straight line jogging, then agility, then sport specific work	The return to sport battery below

Phase 1: protection, 0 to 6 weeks

Brace and range of movement schedule

Timing	Brace setting
Weeks 0 to 2	0 to 30 degrees
Weeks 2 to 4	0 to 60 degrees
At 4 weeks	Reassess whether the brace is still needed
Weeks 4 to 6, if the brace is still required	0 to 90 degrees

Weight bearing

Full weight bearing throughout. There is no period of restricted weight bearing after an isolated MPFL reconstruction. Use crutches only for as long as you need them for comfort and for a normal walking pattern.

The priority in these six weeks: gluteal control and inner range quadriceps.

These two are the foundation of everything that follows. The gluteal muscles control the position of the thigh bone underneath the kneecap, so weak glutes let the knee fall inwards and push the kneecap towards the outside, which is the direction the surgery was done to prevent. Inner range quadriceps work, meaning the last part of straightening, is what holds the kneecap tracking centrally. Both switch off quickly after surgery and both need deliberate work from the first week rather than being left to return on their own.

FOR YOU

Stay inside the brace settings even on days when the knee feels ready for more. Ice, compression and elevation for swelling. Work on the scar once the wounds have healed, and your physiotherapist will show you how. Do your gluteal and quadriceps exercises little and often rather than in one long session.



Gluteal work, from week one

- Clam shells, progressing to a low resistance band above the knee
- Hip abduction in side lying, with slight external rotation
- Bridging, double leg, progressing as tolerated
- Four way straight leg raise: abduction with slight external rotation, adduction, extension, and flexion with slight external rotation

Inner range quadriceps work, from week one

- Quadriceps sets with biofeedback, emphasising terminal knee extension
- Inner range quadriceps work over a roll
- Prone quadriceps set with the foot and ankle on a pillow or foam roll
- Straight leg raise, working towards no extension lag
- **Electrical muscle stimulation as required** where quadriceps recruitment is poor. Start it early rather than waiting

Range, swelling and soft tissue

- Active assisted heel slides with a towel, within the brace settings
- Heel props and prone hangs for full extension
- Patellofemoral joint mobilisation, **with no lateral glides**
- Soft tissue and scar mobility work, and teach self scar mobilisation once healed
- Gastrocnemius, soleus and hamstring stretches
- Resisted ankle range of movement with a band
- Patellofemoral taping as indicated

Balance, core and conditioning

- Weight shifting and double leg balance as weight bearing tolerance allows
- Progress to single leg only once proximal limb control is satisfactory
- Core training in appropriate positions
- Upper body conditioning: upper body ergometer or equivalent

Criteria to progress to Phase 2 [NEW: milestones aligned to current literature]

- Flexion beyond 110 degrees
- Full knee extension
- Straight leg raise without extension lag
- Walking without crutches, with a non-antalgic gait
- No signs of active inflammation
- Patellar mobility improving, with no lateral tracking



Phase 2: strengthening, 6 to 12 weeks

Goals

1. Achieve full range of movement
2. Build quadriceps and gluteal strength, measured rather than assumed
3. Restore normal patellar tracking through quadriceps control
4. Avoid overstressing the graft, watching for dynamic valgus and lateral patellar tracking

Swimming and cycling begin at six weeks. Swim freestyle. **Avoid breaststroke**, because the leg kick loads the knee in exactly the direction the reconstruction is protecting against. Start cycling with a high seat and low resistance, and build up.

FOR YOU

The knee starts to feel like yours again in this phase. Swimming and cycling give you cardiovascular work without impact. Keep up the gluteal work even though the knee now feels stronger, because it is the part people quietly drop once walking feels normal.

FOR YOUR PHYSIOTHERAPIST

- Progress towards full flexion with heel slides and active assisted work
- Continue electrical muscle stimulation while a quadriceps lag or poor recruitment persists
- Closed chain strengthening: partial wall squat and leg press, 0 to 45 degrees, monitoring patellofemoral tracking
- Seated active knee extension where there is no cartilage pathology, in pain free ranges of 90 to 40 degrees
- Step ups, starting low and progressing
- Progressive gluteal work: banded abduction, single leg bridging, controlled lateral movement once gluteal and trunk control allow
- Heel raises and weight bearing calf strengthening
- Hamstring work
- Balance and proprioception, progressing to single leg with perturbation once proximal control is satisfactory
- Cycling and swimming as above. Freestyle only
- Core stability work
- [NEW] Begin objective quadriceps strength testing with a handheld or isokinetic dynamometer in this phase, and repeat it throughout

Patellofemoral contact areas, for exercise selection where there are patellofemoral lesions. The inferior margin of the patella contacts the trochlea at 10 to 20 degrees of flexion. The inferior facets contact the trochlea at 30 degrees. The middle facet articulates with the trochlea at 60 degrees. At 90 degrees the femoral condyles contact the superior facets.



Criteria to progress to Phase 3

- Full knee range of movement
- Quadriceps strength above 60% of the other side [NEW]
- Normal gait pattern
- Good patellofemoral mobility and control, with no lateral tracking and no symptoms of instability
- Double leg partial squat to 30 to 45 degrees with good trunk, hip and lower limb control, and without pain

Phase 3: advanced strengthening, 12 to 16 weeks

Goals

1. Progress strength towards symmetry
2. Develop power and rate of force development
3. Good single limb stability under load and under fatigue
4. Prepare the knee for impact

FOR YOUR PHYSIOTHERAPIST

- Compound lower limb strengthening: squat, deadlift, leg press, split squat, lunge variations, step up and step down
- Unilateral loading to address side specific deficits
- Eccentric work, needed to decelerate and stabilise the knee during change of direction
- [NEW] Power based work as strength allows, to build rate of force development
- Progress balance and proprioception. [NEW] Consider dual task and neurocognitive elements
- Introduce basic change of direction drills
- Introduce plyometrics: double leg box jumps, double leg squat jumps, bound and stick, emphasising landing alignment
- Continue flexibility work, adding quadriceps and iliotibial band stretches as indicated
- Hop testing may begin in this phase once neuromuscular control is sufficient

Criteria to progress to Phase 4

- Quadriceps strength above 80% of the other side [NEW]
- Hop tests above 80% of the other side [NEW]
- No signs or symptoms of patellar instability
- Normal gait mechanics

Phase 4: running and return to sport, from 4 months

Straight line jogging may begin at four months, provided the limb symmetry index criteria are met. Four months is the earliest point, not an automatic one. If the criteria are not met, jogging waits.



Criteria to start straight line jogging

- Full range of movement, or above 95% of the other knee [CONFIRM THRESHOLD]
- Quadriceps limb symmetry index above 70% [CONFIRM THRESHOLD]
- No pain, or pain below 2 out of 10 [CONFIRM THRESHOLD]
- No effusion
- Good lumbopelvic and hip control, and good eccentric quadriceps control during single leg squat and step downs

Running progression

Straight line only to begin with. Turns, cutting and pivoting come later.

1. Treadmill walk and jog intervals, self paced
2. Treadmill running
3. Track: run the straights, walk the turns
4. Track: run the straights and the turns
5. Run on the road
6. Run on the surface specific to your sport

Initially take one to two days off between running days, or as your physiotherapist instructs.

Agility, plyometrics and sport specific work

- Progress plyometrics from double leg to single leg, single plane to multiple planes, stable to unstable surfaces, and controlled to uncontrolled situations
- Progress agility from planned to reactive and multi task drills
- [NEW] Monitor foot contacts per session as a way of progressing plyometrics safely
- Sport specific drills, then non contact training, then contact training, then graded return to competition
- Return to cutting and pivoting sport only after clearance by the surgeon

The three L's, taught throughout.

1. **Land** softly following jumps at all times
2. Stay **low** while running at all times
3. Keep your knees in **line** with your feet at all times

Return to sport criteria

Return to sport is usually between seven and nine months. Testing decides it, not the calendar.

**Return to sport battery** [NEW: thresholds updated from the 2012 version. See change log.]

- **Strength:** quadriceps, hamstrings and hip abductors at 90% or more of the other side, by dynamometry
- **Hop tests:** 90% or more across single hop for distance, triple hop, triple crossover hop and timed hop
- **Balance:** Y-Balance test composite score 90% or more, with less than 4 cm side to side difference on anterior reach
- **Psychological readiness:** MPFL-RSI score above 56
- **Clinical:** no effusion, full range of movement, no apprehension
- **Functional:** tolerates the sport specific programme without symptoms, with movement quality maintained under fatigue
- **Patient reported outcome:** Kujala, IKDC or KOOS, tracked through rehabilitation

Two things worth knowing. Quadriceps strength deficits can persist well beyond clearance to play, so keep testing rather than assuming. And walking mechanics take around a year to fully normalise after this operation, which is longer than the knee feels like it needs.

Combined procedures and special cases

MPFL with tibial tuberosity osteotomy, trochleoplasty or cartilage surgery

Weight bearing and range of movement are modified, and progression is slower throughout. This protocol does not apply unchanged. [ADD SEPARATE COMBINED PROCEDURE PROTOCOL.]

Generalised joint hypermobility

Progression from the strengthening phase onwards is delayed and the criteria are applied more strictly.

Background chronic pain

Where instability sits alongside long standing pain, the pain may not settle after stabilisation surgery. Expectations are set accordingly before the operation and rehabilitation is paced with that in mind.

Extensor mechanism injuries

Rupture of the quadriceps tendon is a different anterior knee problem with its own pathway. See the quadriceps tendon repair rehab protocol.

How this differs from ACL rehabilitation

Patella stabilisation and cruciate ligament surgery protect against different movements, so the protocols are not interchangeable. See the ACL rehab protocol for the comparison.



Children and adolescents

Growing patients follow a modified protocol. See children's knee conditions.

The soreness rules

Use these as a guide to progressing activity at any stage.

What you notice	What to do
Soreness during the warm up that continues into the session	Two days off, and drop down an intensity level
Soreness during the warm up that goes away during the session	Stay at the intensity level that led to the soreness
Soreness during the warm up that goes away, then comes back during the session	Two days off, and drop down one intensity level
Soreness the day after the session, and not ordinary muscle soreness	One day off, and do not advance to the next intensity level
No soreness	Advance one intensity level per week, or as instructed

A note for physiotherapists

UK national guidance from the British Association for Surgery of the Knee, the British Orthopaedic Association and the British Patellofemoral Society advises that physiotherapy after surgery for patellar instability should be delivered by physiotherapists with training and experience in this pathology, or under the supervision of someone who has it. If you are being treated elsewhere, share this protocol at your first appointment along with your operation note.

Frequently asked questions

When can I drive after patella stabilisation surgery?

Driving is self certified. You may drive when you can perform an emergency stop and any evasive manoeuvre without your operated knee hindering the movement. As a guide, we would not usually advise driving before six weeks with an operated right knee, or before six weeks in a manual car with either knee. An operated left knee in an automatic car is often earlier. You cannot drive while the brace is locked. You must also be off opioid painkillers. Tell your insurer.

How long is physio after kneecap surgery?

Physiotherapy after kneecap stabilisation surgery runs for most of the first year. Supervised sessions are usually most frequent in the first three months, straight line jogging starts at around four months, and return to sport is typically between seven and nine months once testing criteria are met.



What is the MPFL rehab protocol?

It is a four phase rehabilitation programme after MPFL reconstruction: protection from 0 to 6 weeks, strengthening from 6 to 12 weeks, advanced strengthening from 12 to 16 weeks, and running and return to sport from four months. You progress between phases by meeting criteria, not by reaching a date.

How long do I wear a brace after patella stabilisation surgery?

The brace is set at 0 to 30 degrees for the first two weeks and 0 to 60 degrees for the next two. At four weeks it is reassessed, and many patients come out of it then. If it is still needed it continues at 0 to 90 degrees for a further two weeks.

Can I walk straight after MPFL reconstruction?

Yes. You weight bear fully from the start after an isolated MPFL reconstruction. Crutches are used only for as long as you need them for comfort and for a normal walking pattern, not because the knee needs protecting from load.

When can I swim or cycle after kneecap surgery?

Both start at six weeks. Swim freestyle and avoid breaststroke, because the breaststroke leg kick loads the knee in the direction the reconstruction is there to resist. Start cycling with a high seat and low resistance.

When can I run after patella stabilisation surgery?

Straight line jogging can begin at four months, provided you meet the criteria: full range of movement, quadriceps strength within the required limb symmetry threshold, no effusion, no significant pain, and good control on single leg squat and step downs. Four months is the earliest point rather than an automatic one.

Why does gluteal strength matter after kneecap surgery?

The gluteal muscles control the position of the thigh bone underneath the kneecap. When they are weak the knee falls inwards and the kneecap is pushed towards the outside, which is the direction the surgery was done to prevent. This is why gluteal work starts in week one rather than later.

Is MPFL rehab the same if I had other surgery at the same time?

No. This protocol covers isolated MPFL reconstruction. If you also had a tibial tuberosity osteotomy, a trochleoplasty or a cartilage procedure, weight bearing and progression are different and slower, and you should follow the protocol given for that combination.

Driving after surgery

Driving is self certified. There is no fixed date at which you are allowed to drive. You may drive when you can perform an emergency stop and any evasive manoeuvre without your operated knee hindering the movement. Only you can judge that, and it varies considerably between people.

As a guide:

- **Operated right knee:** we would not usually advise driving before 6 weeks



- **Manual car, either knee:** we would not usually advise driving before 6 weeks
- **Operated left knee in an automatic car:** often possible earlier, once you can meet the test above

You cannot drive while the brace is locked, so the brace settings for your phase apply as well as the guidance above.

You should also be off opioid painkillers and anything else affecting your reactions, and able to get in and out of the car independently. Try the emergency stop in a stationary car first, then in a quiet car park before driving on the road.

Tell your insurer. Driving before you are medically fit can invalidate your policy if you are involved in an accident.

The DVLA usually does not need to be told about recovery from surgery, unless you are still unable to drive three months afterwards or your surgeon advises it. If you hold a Class 2 licence or drive for work, expect a longer period off the road and speak to your employer.

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About this protocol

Rehabilitation protocol for medial patellofemoral ligament reconstruction, used by Associate Professor Chinmay Gupte, PhD, FRCS (Tr & Orth), MA (Oxon), BMBCh (Oxon), consultant knee and sports injury surgeon, London. Version 2026, superseding the 2012 protocol. Last reviewed [MONTH] 2026. Next review due [MONTH] 2027.

The soreness rules are adapted from the University of Delaware Physical Therapy Clinic.

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This protocol is a general guideline and does not replace the specific instructions given by your own surgeon and physiotherapist. If you are being treated elsewhere, please share this document with your physiotherapist together with your operation note.

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