



PCL Injury Without Surgery

Rehabilitation for an isolated PCL injury treated without surgery

Rehabilitation for an isolated posterior cruciate ligament injury treated without surgery. Associate Professor Chinmay Gupte, PhD, FRCS (Tr & Orth). Version 2026. Last reviewed: [MONTH] 2026.

Most isolated PCL injuries are treated without surgery, and the ligament heals in a brace rather than being replaced. A dynamic PCL brace is worn 23 hours a day for three months and at night until six months. You take half your weight through the leg for four weeks, and isolated hamstring work is avoided for three months while the ligament heals.

Why this works without surgery. Unlike the anterior cruciate ligament, the posterior cruciate ligament has a real capacity to heal itself. The problem is that it heals in whatever position it is held in. Left alone, gravity and the hamstrings pull the shin bone backwards, and the ligament heals long and slack. The brace holds the shin forwards so the ligament heals at the right length, and the rest of the protocol keeps the backward forces off it while that happens.

If you have had a reconstruction, see the PCL reconstruction rehab protocol instead. If your posterolateral corner or another ligament is also injured, non-operative treatment is usually not appropriate. See the PCL and posterolateral corner protocol.

Is non-operative treatment right for this injury?

Non-operative management suits isolated PCL injuries, meaning the PCL alone with no significant injury to the other ligaments. Grade I and grade II injuries are routinely managed this way, and many isolated grade III injuries do well without surgery too.

[LIT] Published criteria supporting non-operative management of an isolated injury are a side to side difference in posterior tibial translation of less than 8 mm on stress radiographs, less than 5 degrees of abnormal rotatory laxity at 30 degrees of knee flexion, and no significant collateral ligament injury causing varus or valgus instability. [CONFIRM: whether these are the thresholds used in your practice.]

Starting treatment early matters. The best published results come from patients who began within four weeks of injury.

The long term point, which most sources leave out. A PCL that heals slack changes how load passes through the knee, and rates of arthritis after PCL deficiency are high, affecting the inner compartment and the kneecap joint in particular. Some series report degenerative change in the majority of patients at five years. This is why the brace regime is followed strictly rather than treated as optional, and why a PCL injury is not the minor problem it can seem when you are told you do not need an operation.



What to expect

The brace is the treatment here, not a comfort measure, which is why it is worn 23 hours a day for the first three months. Most people find the first two weeks the hardest and then adapt.

[LIT] For context on timings: in a study of athletes with isolated grade II and III injuries treated without surgery, the average return to sport specific training was around 10.6 weeks and the average return to full competitive sport was around 16.4 weeks, with over 90% playing at the same or higher level two years later. Those figures come from a protocol with a shorter bracing regime than this one, so treat them as a guide to what is achievable rather than as targets. Progression here is governed by the criteria below.

Recovery timeline at a glance

Phase	Timing	Brace	Weight bearing	Focus
1	Weeks 0 to 4	Dynamic PCL brace, 23 hours a day	50%	Swelling, full extension, quadriceps activation, prone range work
2	Weeks 4 to 8	Dynamic PCL brace, 23 hours a day	Progress to full	Normal gait, range of movement, closed chain strength within limits
3	2 to 3 months	Dynamic PCL brace, 23 hours a day	Full	Full range, progressive strength, still no isolated hamstring work
4	3 to 6 months	Night wear only	Full	Hamstring work introduced, single leg strength, running
5	From 6 months	None, functional brace for sport if advised	Full	Agility, plyometrics, staged return to sport

The brace schedule

- **Months 0 to 3:** dynamic PCL brace worn 23 hours a day. The hour out is for washing
- **Months 3 to 6:** worn at night, because the knee spends hours bent and unsupported during sleep, which is when the shin sags backwards

[CONFIRM: whether a splint in extension is used for the first two weeks before the dynamic brace is fitted, as in the reconstruction protocol, or whether the dynamic brace is fitted from the outset.]



Precautions throughout the first three months

- **No isolated hamstring contraction for 3 months.** The hamstrings pull the shin backwards, directly loading the healing ligament
- **No unsupported knee flexion.** Range work is done lying face down at first, so gravity is not dragging the shin back
- **Support the whole limb when the leg is straight.** Do not let the calf hang
- **Sleep with a pillow under the upper shin** when not in the brace
- Avoid wall slides, deep squatting and anything that lets the shin drop backwards
- Avoid hyperextension and do not pivot on the injured leg

Phase 1: weeks 0 to 4

Brace and weight bearing

Dynamic PCL brace, 23 hours a day. **50% weight bearing with crutches for four weeks.**

FOR YOU

Wear the brace. It is doing the work that surgery would otherwise do, and the ligament heals at the length the brace holds it. Keep the knee straight and supported when resting, ice and elevate for swelling, and use the crutches properly so the leg really is taking about half your weight.

Do not try to bend the knee actively or drag the heel along the bed. That uses the hamstrings, which pull the shin in the wrong direction.

FOR YOUR PHYSIOTHERAPIST

- Prone passive range of movement only, avoiding hamstring guarding
- Patellar mobilisations in all planes
- Quadriceps sets, progressing to straight leg raise. The quadriceps pulls the tibia forwards and is the dynamic partner to the PCL
- Ankle pumps and calf work with the knee in extension
- Side lying and standing hip abduction, adduction and extension
- Electrical stimulation where quadriceps control is poor
- Swelling management with ice, compression and elevation

Criteria to progress

- Full knee extension
- Good quadriceps control, with no lag on straight leg raise
- Flexion beyond 60 degrees passively [CONFIRM TARGET]
- No signs of active inflammation



Phase 2: weeks 4 to 8

Brace and weight bearing

Brace continues at 23 hours a day. **Weight bearing progresses from 50% towards full from four weeks** as comfort and quadriceps control allow. [CONFIRM: rate of progression.] Crutches are discarded when there is no quadriceps lag, full extension is maintained, flexion is 90 to 100 degrees actively, and walking is normal.

FOR YOUR PHYSIOTHERAPIST

- Wall slides, 0 to 45 degrees
- Leg press, 0 to 60 degrees
- Standing four way hip work with resistance above the knee
- Side lying hip external rotation and clam shells
- Monster walks and banded forward and backward walking
- Core work in hook lying
- Gait retraining over level ground

Criteria to progress

- No effusion, swelling or pain after exercise
- Normal gait
- Range of movement equal to the other side

Phase 3: 2 to 3 months

Brace still worn 23 hours a day, and **isolated hamstring work is still not permitted**. This is the phase where people feel well and start doing more than the ligament is ready for.

FOR YOUR PHYSIOTHERAPIST

- Stationary bike set up to minimise hamstring work: foot forward on the pedal, no toe clips, seat slightly high
- Elliptical trainer
- Closed chain terminal knee extension
- Mini squats and leg press, 0 to 90 degrees
- Eccentric step downs from a low step
- Seated calf raises
- Single leg balance with the knee slightly flexed, progressing to unstable surfaces



Phase 4: 3 to 6 months

At three months the brace moves to night wear only, and continues at night until six months. Isolated hamstring work may now be introduced, built gradually rather than started at load.

FOR YOUR PHYSIOTHERAPIST

- Gym based strengthening: leg press, hip machines, squat to chair, lateral lunges
- Romanian deadlift, which keeps hamstring force close to vertical at a small knee flexion angle rather than pulling the shin backwards
- Single leg progression: single leg press, step ups, lateral step ups, step downs, single leg squats
- Bridges progressing to single leg bridges
- Balance and proprioception with perturbation
- Conditioning: treadmill walking, pool jogging, swimming with **no breaststroke or frog kick**
- Interval running programme once the criteria below are met

Criteria to start running and impact work

- Full pain free active and passive range of movement
- Quadriceps, hamstring and hip strength at 80% of the other leg by handheld dynamometer [CONFIRM THRESHOLD]
- No pain or swelling after exercise
- Clinical review confirming stability has not deteriorated

Phase 5: from 6 months, return to sport

Agility and plyometrics progress from straight line, to lateral, to multiplanar. Return is staged through non contact practice, full practice, then full play.

Return to sport battery

- **Strength:** quadriceps, hamstring and gluteal index at 90% or more of the other leg [CONFIRM THRESHOLD]
- **Hamstring to quadriceps ratio:** 66% or more
- **Hop tests:** 90% or more, with good landing mechanics
- **Patient reported outcome:** KOOS sport above 90%, IKDC above 93
- **Psychological readiness** assessed formally
- **Clinical:** no effusion, full range of movement, running programme completed without pain or swelling
- **Clinical review** before returning to pivoting or contact sport



Follow up and when surgery is reconsidered

Non-operative treatment is not a decision made once. Progress is reviewed, and stress radiographs may be repeated to see how the ligament has healed and whether the backward sag has improved.

Reconstruction is reconsidered if:

- Instability persists or the knee gives way during rehabilitation
- Posterior sag increases rather than improves
- Symptoms fail to settle despite a properly completed programme
- A further injury occurs

[CONFIRM: your follow up schedule and whether repeat stress radiography is routine.]

Frequently asked questions

When can I drive with a PCL injury?

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 at 50% weight bearing. You must also be off opioid painkillers. Tell your insurer.

Can a PCL injury heal without surgery?

Yes. The posterior cruciate ligament has a genuine capacity to heal, unlike the anterior cruciate ligament. The purpose of the brace is to hold the shin bone forwards so the ligament heals at the correct length rather than long and slack.

How long do I wear a PCL brace?

A dynamic PCL brace is worn 23 hours a day for three months, with the hour out for washing. From three to six months it is worn at night, because the knee spends hours bent and unsupported during sleep.

How long does a PCL injury take to recover without surgery?

Everyday activities return over the first two to three months. Running follows once strength and range criteria are met, and return to sport is staged after that. Published series of athletes report an average return to sport specific training at around ten weeks and full competitive sport at around sixteen weeks, though the brace regime used here is more protective.

Why can't I use my hamstrings after a PCL injury?

The hamstrings pull the shin bone backwards, which is the movement a torn PCL can no longer control. Loading them while the ligament heals stretches it. Isolated hamstring work is avoided for three months.



Do I need surgery for a PCL tear?

Most isolated PCL injuries do not need surgery. Reconstruction is usually reserved for injuries where another ligament is also torn, where instability persists despite a properly completed rehabilitation programme, or where the backward sag increases rather than improves.

Will a PCL injury cause arthritis later?

A PCL that heals slack alters how load passes through the knee, and rates of arthritis after PCL deficiency are high, particularly in the inner compartment and the kneecap joint. This is the main reason for following the brace regime strictly rather than treating it as optional.

Can I walk with a PCL injury?

Yes, taking about half your body weight through the leg with crutches for the first four weeks, in the brace. Full weight bearing follows from four weeks as comfort and quadriceps control allow.

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

In addition, you cannot drive at 50% weight bearing, so driving does not start before 4 weeks at the very earliest.

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.

References

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About this protocol

Rehabilitation protocol for isolated posterior cruciate ligament injury treated without surgery, used by Associate Professor Chinmay Gupte, PhD, FRCS (Tr & Orth), MA (Oxon), BMBCh (Oxon), consultant knee and sports injury surgeon, London. Version 2026. Last reviewed [MONTH] 2026. Next review due [MONTH] 2027.

Bracing, weight bearing and hamstring restrictions are set by the treating surgeon. Eligibility criteria, range milestones, expected timings and the return to sport battery draw on published PCL literature.

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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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