



Children's ACL Rehab Protocol

Paediatric ACL rehabilitation guidelines

Paediatric ACL rehabilitation guidelines. Sportshealing and Professor Chinmay Gupte. © Sportshealing Ltd 2022.

Rehabilitation after ACL reconstruction in a child or adolescent runs in six phases, with full return to play usually at 10 to 12 months. The first eight weeks protect the graft fixation, with 50% weight bearing for six weeks and a staged range of movement. Later phases progress through strength, agility, landing mechanics and a structured return to team practice.

These guidelines are for children and adolescents. They are not the adult protocol with the numbers adjusted. If you are an adult, see the ACL rehab protocol.

This protocol is a general guideline. Always follow the specific instructions given by your own surgeon and physiotherapist.

Phases at a glance

Phase	Timing	Clinic appointment
1	Surgery to 8 weeks	Wound check and suture trimming 10 to 18 days after surgery
2	8 to 14 or 16 weeks	With Professor Gupte at 6 to 8 weeks
3	14 to 22 weeks	With Professor Gupte at 12 to 16 weeks
4	22 to 36 weeks	With Professor Gupte at 6 months
5	6 to 9 months	With Professor Gupte at 9 to 12 months
6	Usually 10 to 12 months after surgery	Individualised

Phase 1: surgery to 8 weeks

APPOINTMENTS

Rehabilitation appointments begin 2 to 3 weeks after surgery and should be 1 to 2 times per week during this phase. The hospital physiotherapist will see the patient after surgery, issue standard exercises and ensure safety on crutches.

Clinic appointment or GP wound check and suture trimming 10 to 18 days after surgery.

REHABILITATION GOALS

- Protection of healing graft fixation, and swelling and pain management
- Restore quadriceps function and leg control
- Adherence to the home exercise programme and precautions



PRECAUTIONS

- Ice to the knee 15 minutes 4 to 5 times a day for the first 2 weeks, then reduce as appropriate
- **Weight bearing:** 50% weight bearing, touch down weight bearing, for 6 weeks with crutches
- **Brace:** [QUERY: this field is blank in the source document]
- **Range of movement:** weeks 1 to 2, 0 to 30 degrees. Weeks 3 to 4, 30 to 60 degrees. Weeks 5 to 6, 60 to 90 degrees

Staying within the range of movement guidelines is imperative to protect the periosteal stitch on the tibia.

[QUERY for the author, not for publication: the range bands are reproduced exactly as written in the source, so the lower bound rises each fortnight, from 0 to 30, then 30 to 60, then 60 to 90. Please confirm whether these are intended as the permitted arc for that fortnight, or whether the intention is 0 to 30, 0 to 60 and 0 to 90. Nothing has been altered.]

SUGGESTED THERAPEUTIC EXERCISE

- Assisted seated knee flexion for range of movement, within the guidelines above
- Knee extension range of movement, avoiding hyperextension past 5 degrees
- Ankle pumps, progressing to resisted ankle range of movement
- Patellar mobilisations, especially superior mobilisations to minimise adhesions within the fat pad
- Quadriceps sets: static quadriceps
- Straight leg raises

CARDIOVASCULAR EXERCISE

None at this time.

Phase 2: 8 to 14 or 16 weeks

APPOINTMENTS

Rehabilitation appointments 1 to 2 times per week. Clinic appointment with Professor Gupte at 6 to 8 weeks.

REHABILITATION GOALS

- Normalise gait
- Avoid oversteering the fixation site
- Closed chain leg control for non-impact movement control
- Adherence to the home exercise programme

PRECAUTIONS

- Weight bearing as tolerated
- Gradual progression to full knee flexion range of movement
- Avoid overloading the fixation site by using low amplitude, low velocity movements



- No active inflammation or reactive swelling

SUGGESTED THERAPEUTIC EXERCISE

- Gait drills: forward and backward march walk, soldier walk
- Double leg balance drills: balance board, tandem balance
- Closed chain strengthening for quadriceps and glutes: double leg squat progressions, split squats, step backs, leg press
- Bridging if tolerated
- Balance board drills: double leg balance
- Hip and core strengthening

RANGE OF MOVEMENT EXERCISES

- Supine wall slides to 60 degrees
- Heel slides
- Knee to chest, to gradually improve knee flexion
- Stationary bike with low resistance
- Aquatic therapy as needed

CARDIOVASCULAR EXERCISE

- Stationary bike with low resistance
- Deep water running
- Elliptical trainer

Progression criteria

- Normal gait
- Symmetric weight acceptance for squats to 60 degrees
- No reactive swelling after exercise or activity that lasts for more than 12 hours

Phase 3: 14 to 22 weeks

APPOINTMENTS

Rehabilitation appointments as needed, usually once every 1 to 2 weeks. Clinic appointment with Professor Gupte at 12 to 16 weeks.

REHABILITATION GOALS

- Normal gait pattern
- Good core and gluteal control
- Stable single leg control
- 15 to 20 minutes a day home exercise programme

PRECAUTIONS

No active reactive swelling or joint pain that lasts more than 12 hours.



SUGGESTED THERAPEUTIC EXERCISE

- Calisthenic low impact exercises, and gym or elastic bands
- Double and single leg squats to 90 degrees
- Double leg presses, building up to body weight
- Single leg presses to 70% body weight
- Hamstring curls
- Elastic band 15 minute programme
- Glute bridges
- Stretches
- Full flexion range
- Quadriceps sets: static quadriceps
- Straight leg raises

CARDIOVASCULAR EXERCISE

- Stationary bike with moderate resistance
- Deep water running and swimming
- Elliptical trainer at moderate intensity

Progression criteria

- Normal fast walking gait
- Good single leg balance
- Less than 25% deficit on Biodex strength test
- No reactive swelling after exercise or activity

Phase 4: 22 to 36 weeks

APPOINTMENTS

Rehabilitation appointments once every 2 to 4 weeks. Clinic appointment with Professor Gupte at 6 months.

REHABILITATION GOALS

- Normal running gait, without side to side differences or compensations
- Normal double leg landing control, without side to side differences or compensations, for sub-maximal squat jump
- Adherence to the home exercise programme

PRECAUTIONS

- No active reactive swelling or joint pain that lasts more than 12 hours
- No pivot training or high impact

SUGGESTED THERAPEUTIC EXERCISE

- Low amplitude, low velocity agility drills: forward and backward skipping, side shuffle, skater's quick stepping, carioca, cross overs, backward jog, forward jog



- Closed chain strengthening for quadriceps and glutes, progressing from double leg strengthening to single leg strengthening: lunge progressions and single leg squat progressions
- Single leg balance exercises and progressions, progressing from stationary to deceleration into holding posture and position
- At around 26 weeks, initiate low amplitude landing mechanics: medicine ball squat catches, shallow jump landings, chop and drop stops, and similar
- Core strength and stabilisation

CARDIOVASCULAR EXERCISE

- Stationary bike with moderate resistance
- Deep water running and swimming
- Elliptical trainer at moderate intensity
- Gentle straight line, soft ground jogging

Progression criteria

- Normal jogging gait
- Good single leg balance
- Less than 25% deficit on Biodex strength test
- No reactive swelling after exercise or activity
- 80% hamstring and quadriceps performance compared with the non-operated side
- Good gluteal control on single leg squat testing
- Good core control

Phase 5: 6 to 9 months

APPOINTMENTS

Rehabilitation appointments once every 2 to 4 weeks. Clinic appointment with Professor Gupte at 9 to 12 months.

REHABILITATION GOALS

- Normal multi-planar high velocity movement, without side to side differences or compensations
- Normal double leg landing control, without side to side differences or compensations
- Adherence to the home exercise programme

PRECAUTIONS

No active reactive swelling or joint pain that lasts more than 12 hours.

SUGGESTED THERAPEUTIC EXERCISE

- Progressive agility drills: forward and backward skipping, side shuffle, skater's quick stepping, cross overs, backward jog, forward jog
- Landing mechanics, progressing from higher amplitude double leg to single leg landing drills. Start uni-planar and gradually progress to multi-planar



- Movement control exercise, beginning with low velocity, single plane activities and progressing to higher velocity, multi-plane activities
- Unanticipated movement control drills, including cutting and pivoting
- Deceleration training
- Strength and control drills related to sport specific movements
- Sport and work specific balance and proprioceptive drills
- Hip and core strengthening
- Stretching for patient specific muscle imbalances

CARDIOVASCULAR EXERCISE

Progressive running programme, designed to use sport specific energy systems.

Progression criteria

The patient may return to sport after receiving clearance from the orthopaedic surgeon and the physiotherapist or athletic trainer. Progressive testing will be completed. The patient should have less than 15% difference in Biodex strength test, force plate jump and hop tests, and functional hop tests.

Phase 6: begins after meeting Phase 5 criteria, usually 10 to 12 months after surgery

This phase is individualised based on the athlete's sport and continued physical impairment or performance needs. During this phase athletes will be allowed to return to team practices with criteria and limitations from the physiotherapist. This may include time, volume or specific activity.

Practice continuum

1. **Movement patterns:** sprinting, shuffle, carioca, zig-zag cutting, and shuttle change of direction
2. **Closed drills:** sport specific drills without opposition in a controlled speed environment
3. **One-on-one drills, no contact:** sport specific drills and activities where the athlete is expected to react to their opponent without compensation
4. **One-on-one drills:** full speed one on one drills with game necessary contact
5. **Team practice, no contact:** patients are asked to wear a different coloured jersey to indicate their contact restrictions during team scrimmaging when appropriate
6. **Team practice:** full contact
7. **Restricted play:** progressing time and situational play as appropriate
8. **Full return to play**

Return to sport

The patient may return to sport after receiving clearance from the orthopaedic surgeon and the physiotherapist or athletic trainer. Progressive testing will be completed. The patient should have less than 10 to 15% difference in Biodex strength test, force plate jump and hop tests, and functional hop tests.



Frequently asked questions

Every answer below is drawn from the protocol above. No new guidance has been added.

How long does ACL rehab take for a child or teenager?

The programme runs in six phases. Phase 6 begins after the Phase 5 criteria are met, usually 10 to 12 months after surgery, and full return to play comes at the end of the practice continuum within that phase.

How much weight can my child put through the leg after ACL surgery?

50% weight bearing, touch down weight bearing, for 6 weeks with crutches. Weight bearing as tolerated follows from 8 weeks in Phase 2.

Why are there range of movement limits in the first six weeks?

Staying within the range of movement guidelines is imperative to protect the periosteal stitch on the tibia.

When can my child start running after ACL reconstruction?

Gentle straight line jogging on soft ground appears in Phase 4, which runs from 22 to 36 weeks. A progressive running programme designed around sport specific energy systems follows in Phase 5.

When can my child go back to team sport?

Return to team practice happens in Phase 6, usually from 10 to 12 months after surgery, through a structured practice continuum that runs from movement patterns through closed drills, one-on-one drills, non-contact and then full contact team practice, restricted play, and finally full return to play.

What testing is needed before returning to sport?

Clearance from the orthopaedic surgeon and the physiotherapist or athletic trainer, following progressive testing. The patient should have less than 10 to 15% difference in Biodex strength test, force plate jump and hop tests, and functional hop tests.

References

The protocol above is reproduced without clinical amendment. The references below are supporting literature added for the web page and do not form part of the 2022 document.

1. British Orthopaedic Association, in association with the British Association for Surgery of the Knee. BOAST: Management of Anterior Cruciate Ligament Injury in the Skeletally Immature Patient. May 2022.
2. van Melick N, van Cingel RE, Brooijmans F, Neeter C, van Tienen T, Hullegie W, Nijhuis-van der Sanden MW. Evidence-based clinical practice update: practice guidelines for anterior cruciate ligament rehabilitation based on a systematic review and multidisciplinary consensus. *British Journal of Sports Medicine* 2016;50(24):1506 to 1515.
3. Grindem H, Snyder-Mackler L, Moksnes H, Engebretsen L, Risberg MA. Simple decision rules can reduce reinjury risk by 84% after ACL reconstruction: the Delaware-Oslo ACL cohort study. *British Journal of Sports Medicine* 2016;50(13):804 to 808.



About this protocol

Sportshealing and Professor Chinmay Gupte paediatric ACL rehabilitation guidelines. © Sportshealing Ltd 2022. Reproduced without clinical amendment. See also Associate Professor Chinmay Gupte and the adult ACL rehab protocol.

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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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