ADVANZ HEALTH

SPORTS MEDICINE | PHYSIOTHERAPY

ACL

REHABILITATION PROTOCOL

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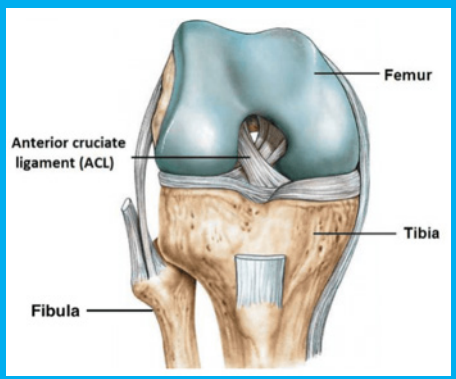
ACL

ACL Reconstruction
An ACL reconstruction involves surgery to repair the torn Anterior Cruciate Ligament. The main grafts used are hamstring tendon or patella tendon. Occasionally, a transplanted tissue from a donor is required. There is an increasing incidence of ACL reconstructions in young Australians. The individuals at greatest risk are men aged 20-24 years and women ages 15-19 years.

Mechanism of Injury
The most common way the ACL ruptures is from non-contact injury which normally involves pivoting or cutting (change of direction) during sport. The injury can also occur from contact activities (e.g. being tackled where your knee is forced inwards while the leg is held in a fixed position). When this occurs, patients usually describe a “cracking” or “popping” sensation at the time of the injury.

Anatomy
The ACL is one of the 4 main ligaments in the knee that provides stability to the joint. It provides stability when the knee is rotating during changing directions, or forward movement of the shin in relation to the thigh bone.



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PROGNOSIS POST SURGERY

Recovery and rehabilitation after an ACL reconstruction takes approximately 9-12 months. During this period, you will commence a structured and individualised rehabilitation program and gradually return to your normal activities. This process is designed to safely improve the strength, motion and balance (proprioception) in your knee whilst the ACL graft heals.

PROTOCOL USER GUIDE

This protocol is a guide for both clinicians and patients who have undergone ACL reconstruction surgery. Every person's situation is different, therefore you should move through the protocol at your own pace. The "progress criteria" will dictate how quickly you progress (it is not timeline based).

To progress through the protocol as fast as possible with minimal problems:

- Maintain knee extension range (knee straight)
- Use pain and swelling as a guide. If the pain increases, then the knee is not tolerating what you're doing to it.

Clinicians should use a clinical reasoning approach in prescribing an exercise rehabilitation program and management advice for each phase. This protocol briefly suggests typical exercises for each phase, but programs should always be individualised.

PRE-OP PHASE

Physiotherapy prior to surgery is important to reduce the swelling, regain movement and limit the loss of strength in the muscles are your knee. It also allows the clinician time to educate the patient about post-surgery expectations and familiarises them to the rehabilitation exercises..

GOALS	PRECAUTIONS	RECOMMENDED PROGRAM	CRITERIA TO PROGRESS TO NEXT PHASE *(TICK WHEN COMPLETE)*
• Patient understands timeframes of healing process and rehabilitation process • Normal gait pattern • Muscle re-education and activation especially in the quadriceps • Maintain fitness • Get knee straight • Settle swelling	• Screen for contraindications and red flags	1. Education on importance of compliance of rehab program 2. Ice therapy for pain relief (GameReady in clinic or ice-bath at home) 3. Stretching program to increase range of motion of knee 4. Activation and strengthening of knee, hip, ankle, core. 5. Single leg balance 6. Fitness maintenance: 7. Gym-based exercises for upper body, bike.	Rehabilitation occurs up until the surgery date

Please note that the below timeframes are a guide. Your surgeon or physio may request slight variations for optimum outcome.

PHASE 1 - EARLY REHAB (0-3 WEEKS)

GOALS	PRECAUTIONS	RECOMMENDED PROGRAM	CRITERIA TO PROGRESS TO NEXT PHASE *(TICK WHEN COMPLETE)*
• Patient understands timeframes of healing process and rehabilitation process • Normal gait pattern (off crutches within 1-2 weeks) • Muscle re-education and activation especially in the quadriceps • Maintain fitness • Get knee straight • Settle swelling	• Screen for contraindications and red flags • Monitor for side effects e.g. infection, DVT	1. Education on importance of compliance of rehab program 2. Ice therapy for pain relief (GameReady in clinic or ice-bath at home) 3. Manual therapy and physio treatment to increase range of motion of knee 4. Activation and strengthening exercises (see phase 1 exercises) 5. Gait retraining	☐ Knee straight to 0 degrees ☐ Knee able to bend 100 degrees ☐ Little to no swelling ☐ Quadriceps lag test = 0-5 degrees lag ☐ Normalised gait

PHASE 2 – STRENGTH PHASE (3-6 WEEKS)

GOALS	PRECAUTIONS	RECOMMENDED PROGRAM	CRITERIA TO PROGRESS TO NEXT PHASE *(TICK WHEN COMPLETE)*
• Full AROM • Normal gait at higher speeds • Regain balance and proprioception	• Avoid exercise that causes more than moderate pain (>3/10)	1. Stretching program 2. Reformer pilates based rehabilitation (see phase 2 reformer videos) 3. Home strengthening program for hip/ knee/core (see phase 2 videos) 4. Stationary bike 5. Manual therapy by physiotherapist	☐ No swelling ☐ Pain free AROM and higher-level gait ☐ Single leg bridge within 95% of uninjured side ☐ No pain with activity ☐ Single calf raise 95% compared to uninjured side

PHASE 3 – FUNCTIONAL STRENGTHENING (6-12 WEEKS)

GOALS	PRECAUTIONS	RECOMMENDED PROGRAM	CRITERIA TO PROGRESS TO NEXT PHASE *(TICK WHEN COMPLETE)*
• Pain free functional weight-bearing activity • Single leg strengthening and muscle hypertrophy	• Avoid activity that causes pain greater than 3/10 on VAS • 3-month mark is the time point where the graft is at its weakest	1. Proprioception/ balance exercises (see phase 3 videos) 2. Progressed strengthening (PRT in gym) for lower limb and core (see videos) 3. Continue aerobic training on bike and upper body strength 4. Manual therapy by physiotherapist	☐ >95% uninjured leg on: -Single leg sit-to-stand -Single leg bridge -Single leg Calf strength -Balance -Full pain-free ROM Adequate core strength testing

PHASE 4 – DYNAMIC REHAB (12 WEEKS-6 MONTHS)

GOALS	PRECAUTIONS	RECOMMENDED PROGRAM	CRITERIA TO PROGRESS TO NEXT PHASE *(TICK WHEN COMPLETE)*
• Safely increase running and dynamic exercises (hopping/ jumping) • Progress towards 85% running speed/ agility by 6 months (in controlled setting)	• Increase running speed and intensity slowly • No contact or training with team	1. Advanced proprioception/ balance exercises (see videos) 2. Advanced strengthening for lower limb and core (see videos) 3. Running rehab program 4. Dynamic jumping/ hopping program 5. Manual therapy by physiotherapist to address alignment/ tightness issues	☐ Build slowly to 85% speed and pain-free with running and agility tests ☐ Build slowly to 85% uninjured leg with hopping/ jumping/balance tests (see below) Adequate core strength testing

PHASE 5 – SPORTS SPECIFIC REHAB (6 MONTHS - 9 MONTHS)

NB: PATIENTS UNDER 21 YEARS WILL CONTINUE UNTIL 12 MONTHS

GOALS	PRECAUTIONS	RECOMMENDED PROGRAM	CRITERIA TO PROGRESS TO NEXT PHASE *(TICK WHEN COMPLETE)*
• Pain free with all activities • Full strength and power with all activities • Physical and mental preparation for return to full sport/activities	• Care with contact and falling progressions • Avoid uncontrolled training environments in early phase 5	1. Advanced proprioception/ balance exercises (challenging reaction times and distractions) 2. Sports-specific strength, power and agility under fatigued conditions 3. Whole-body biomechanical optimisation 4. Sports-specific cardiovascular fitness 5. Tacking, contact and falling training 6. Psychological preparation for RTS	☐ Return to sport testing as per below ☐ Full pain-free ROM ☐ 100% speed and agility with running ☐ Passed return to contact where relevant ☐ Reaction time testing ☐ Core strength testing

RETURN TO SPORT TESTING

These are general return-to-sport tests and we recommend that an individualised testing routine should be used for each client based on their relevant goals and sport (e.g. running speed/agility, swimming performance etc).

EXERCISES	DESCRIPTION	CRITERIA TO PROGRESS BACK TO SPORT
Single leg hop for distance	Test description: • Maximal distance hop performed • Must stick landing for 2 seconds • Assess knee valgus and lateral trunk shift/ Trendelenberg	• No pain • 95-100% function of the uninjured side • Good form/technique
Triple hop for distance	Test description: • Hop for distance on same leg 3 times and stick landing for 3 seconds	• No pain • 95-100% function of the uninjured side • Good form/technique
Triple cross over hop test	Test description: • Start on left side of the line with R foot and hop across midline 4 times (crossover) • Repeat other side • Note distance, accuracy and technique	• No pain • 95-100% function of the uninjured side • Good form/technique
Lateral hop test	Test description: • Hop side to side over 30cm wide tape • As many times as they can in 30secs • Lose 1 point every time they touch the tape • Repeat other side	• No pain • 95-100% function of the uninjured side • Good form/technique

RETURN TO SPORT TESTING

EXERCISES	DESCRIPTION	CRITERIA TO PROGRESS BACK TO SPORT
Balance (Dynamic)	Test description: Subjects stand on one leg with a small amount of flexion in the hip, knee and ankle, and place their hands on their waist. In this position, two assessments are performed: 1. Side to side At a rate of 60 beats per minute, subjects repeatedly turn their head from side to side (70-90 degree turn) for a period of 15 seconds. Vision needs to be in line with head position (no visual fixing). 2. Up and down At a rate of 60 beats per minute, subjects repeatedly tilt their head up and down (looking floor to ceiling) for a period of 15 seconds. Vision needs to be inline with head position (no visual fixing). The test is passed if subjects can maintain single leg stance and do not take their hands off their waist for both assessments	Pass both limbs
Range of motion	• Knee • Hip • Ankle	Range of motion must be 95-100% of uninjured side
Drop vertical jump	• Start on 50cm box box • Jump off with arms overhead and rebound into a jump	Knee valgus angle not >170deg Lateral trunk shift angle not > 20deg

RETURN TO SPORT TESTING

This is a general return to sport test and an individualised testing routine should be used for each client and their relevant goals and sport.

EXERCISES	DESCRIPTION	CRITERIA TO PROGRESS BACK TO SPORT
Drop vertical hop	• Start on Pilates box Jump off with arms overhead and rebound into a hop, each side	• Knee valgus angle not >170deg • Lateral trunk shift angle not > 20deg

*Testing should be done under same conditions each time (fatigued or non-fatigued).

Criteria to pass each test is:

1. No pain
2. 95-100% function of the uninjured side
3. Good form/technique

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