

Cone Health ACL Protocol

Phase 1: Immediate Post-Op (0-2 weeks after surgery)

Goals:

- Protect surgical site
- Control pain and inflammation
- Achieve full **passive knee extension**
- Begin gentle knee flexion
- Initiate quad activation
- Promote normal patellar mobility
- Begin safe WBAT

Appointments	Post-Op evaluation should try and be performed 3-5 days following surgery. Follow up visits depends on progressions but should aim for 1-2x per week
Precautions	No forced flexion beyond 90 deg x4 weeks WBAT x4weeks
ROM	<ul style="list-style-type: none"> • Extension: focus on achieving full knee extension immediately after surgery • Flexion: No forced flexion past 90 deg for meniscal repairs, ACL goal is for symmetry (120 deg for functional mvnt)
NMES Parameters	10-20 seconds on/ 50 seconds off x 15 min <ul style="list-style-type: none"> • Criteria for stopping NMES unbreakable 5/5 MMT, 10 SLR without extensor lag, 10x 4" box step downs
Criteria to Progress from AD	<ul style="list-style-type: none"> • Near full knee extension, performance of SLR without quad lag • Flexion: within 10 deg of contralateral side • Extension: ROM equal to contralateral side

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Weight Bearing	<ul style="list-style-type: none"> Initially brace locked (MD protocol) Ween from assistive device as appropriate for proper gait May unlock brace once able to perform SLR without lag Stairs: “up with the good down with the bad”
Exercise Examples	<ul style="list-style-type: none"> See exercise outline at end of protocol

Phase 2: Intermediate Post-Op (3-6 weeks after surgery)

Goals:

- Continue graft protection
- Achieve full extension and at least 120 deg flexion
- Normalize gait pattern and begin early functional strengthening
- Restore neuromuscular control and muscle activation

Appointments	<p>1-2x/week depending on swelling, ROM progress, and gait deviations</p> <p>Continue use of NMES for quad activation PRN, especially if quad lag persists</p>
Precautions	<ul style="list-style-type: none"> • No running, jumping, or twisting movements • Avoid deep squatting (>60 deg) under load • Monitor for joint effusion or increased pain after new activities • Use assistive device as needed to maintain normal gait (especially if quad control remains limited)
Exercise Focus	<ul style="list-style-type: none"> • Progress static to dynamic quad strengthening • Improve hip and core strength • Emphasize symmetrical weight-bearing and normal gait mechanics • Begin closed-chain exercises within a safe ROM • Begin BFR when stitches are removed, and wounds healed
Exercise examples	<ul style="list-style-type: none"> • See exercise outline at end of protocol

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Weight Bearing	<ul style="list-style-type: none"> • WBAT, continue brace per MD guidance • Wean from assistive device once normal gait is achieved without compensation • May unlock brace or remove it for controlled exercises if quad control is adequate
Criteria to Progress	<ul style="list-style-type: none"> • Minimal to no swelling • Full extension and flexion within 10 deg of contralateral knee • No quad lag with SLR • Controlled, symmetrical gait pattern without assistive device • Able to tolerate basic closed-chain exercises and bike work without joint irritation

Phase 3: Late Post-Op (6-8 weeks after surgery)

Goals:

- Achieve full symmetrical ROM
- Begin light impact and proprioceptive training
- Build baseline strength and neuromuscular control
- Normalize gait and stair navigation

Appointments	1-2x/week depending on progress and need for supervised exercise correction
Exercise Focus	<ul style="list-style-type: none"> • Continue with strengthening (quads, glutes, hamstrings) • Progress to controlled functional movement (step downs, balance) • Begin light dynamic movements (elliptical, pool work) • Continue BFR if found to be beneficial
Exercise Examples	<ul style="list-style-type: none"> • Dead lifts • Weighted squats • Goblet squat • Rebounder • Cone reaches • Star drill • Eccentric step downs • Spanish squats

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Exercise Examples cont.	<ul style="list-style-type: none"> • Encourage patient to load their quad/glutes/ calf at a gym following RPE • Standing banded hip 3 way bilateral (start with band above the knee) • See exercise outline at end of protocol
Criteria to Progress	<ul style="list-style-type: none"> • Full ROM (within 5 deg of contralateral) • No gait deviations • Ability to perform basic functional tasks pain-free (step-ups, squats) • Good quad control and strength (no lag with SLR, >4/5 manual testing)

Phase 4: Transitional (9-16 weeks after surgery)

Goals:

- Build tolerance to higher-load movements
- Initiate low-intensity plyometrics and sport-related drills
- Restore neuromuscular control under load
- Normalize early return-to-run form

Appointments	1x/week for monitoring and progress of sport-specific drills
Exercise Focus	<ul style="list-style-type: none"> • Controlled jumping/landing drills • Direction changes under supervision • Begin linear jogging (with proper form) • Introduce more resistance to strength work (leg press, RDL, lunges) • See exercise outline at end of protocol
Criteria to Progress	<ul style="list-style-type: none"> • Jogging tolerance without swelling or pain • Controlled single-leg landings and squats • 80% strength compared to uninvolved side • No reactive swelling after sessions

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Initial testing	<ul style="list-style-type: none"> • Initial testing performed between 12-16 weeks depending on patient's tolerance to a max contraction • Strength testing performed with Tindeq/ isokinetic machine/ hand dyno should be within 80% of contralateral leg for return to straight line running • Good single leg control on eccentric step down drill 6-inch, 20 x • 80% on Y balance test. If Y balance not available but good control on eccentric step down
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Phase 5: Early Return to Sport (4-6 months after surgery)

Goals:

- Advance movement complexity, speed, reactivity
- Begin cutting, pivoting, and controlled contact
- Address psychological readiness (fear, confidence)

Appointments	1x/week or biweekly for supervised return to sport progression
Exercise Focus	<ul style="list-style-type: none"> • Agility drills (shuttles, cone drills) • Deceleration and direction change technique • Advanced plyometrics (bounding, box jumps, hops) • Progressive return-to-play protocol (non-contact scrimmage) • See exercise outline at end of protocol
Criteria to Progress	<ul style="list-style-type: none"> • Hop testing $\geq 90\%$ LSI (limb symmetry index) • IKDC, KOOS-sports $\geq 90\%$ • Neuromuscular control with all dynamic movements • Clearance by orthopedic/sports medicine provider

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Phase 6: Unrestricted Return to Sport (6+ months after surgery)

Goals:

- Sport readiness
- Confidence in performance
- Full participation with control

Provider notes to consider:	<ul style="list-style-type: none">• This phase is heavily sport specific• Functional training should be integrated before this phase
Criteria to Progress	<ul style="list-style-type: none">• Strength and hop test >95% demonstrating good landing mechanics• T-test• ACL-RSI and psychological readiness confirmed• No reactive effusion with sport-specific activity• Normalized gait and jogging mechanics• Appropriate neuromuscular control and force attenuation strategies with high level impact movements
Sport Specific Progression	Non-contact → full practice → full play (~9mo-1yr)

Week 1-2: Immediate Post-Op

Focus: Protect graft, control swelling, regain knee extension, quad activation

Exercise	Frequency
Quad Sets	5x10 reps/day
Straight Leg Raise (if no lag)	3x10 reps
Heel Slides	10 min, 2x/day
Ankle Pumps	Hourly
Patellar Mobilizations	2x/day
Prone Hangs / Heel Props	Hold 2-3 minutes
Supine Hamstring Stretch	3x30 sec
Calf Stretch (Wall)	3x30 sec
Seated Assisted Flexion (with strap)	2x/day
Ice + Elevation	4-6x/day
NMES Quad Stim (Therapist)	2x/week

Week 3-4: Early Intermediate

Focus: Improve flexion, normalize gait, build strength

Exercise	Frequency
Continue Week 1-2 Exercises	Daily
Stationary Bike (no resistance)	10-15 min/day
Wall Slides (0-45°)	3x10 reps
Mini Squats (0-60°)	3x10 reps
Step-Ups (4" step)	3x10 reps
Hip Bridges	3x10 reps
Clamshells (banded if tolerated)	3x10 reps
Standing Hamstring Curls	3x10 reps
Standing Heel Raises	3x15 reps
Single-Leg Balance (Eyes Open)	3x30 sec/leg

Week 5-6: Late Intermediate

Focus: Normalize ROM, build strength & endurance

Exercise	Frequency
Continue Week 3-4 Exercises	Daily
Wall Squats (with ball)	3x10 reps
Step-Ups with March	3x10 reps
Bridge on Physio Ball	3x10 reps
Side Planks with Leg Lift	3x10 reps
Single-Leg Balance (Unstable Surface)	3x30 sec/leg
Side-Lying Hip Abduction	3x10 reps
Prone Hamstring Curls (light resistance)	3x10 reps
LAQ Load following RPE guidelines (RPE 5-6)	3x10 reps
Elliptical/Stair Stepper	10-15 min if cleared

Week 7-8: Strength & Movement Pattern Focus

Focus: Strength, movement quality, cardio conditioning

Exercise	Frequency
Leg Press (light, 0-60°)	3x10 reps
Romanian Deadlift (bodyweight/light weight)	3x10 reps
Lateral Lunges	3x10 reps
Step-Downs (4-6")	3x10 reps
Single-Leg Bridges	3x10 reps
Knee Extensions (90-45° range)	3x10 reps
Swimming (flutter kick)	As tolerated
Pool Jogging	As tolerated
Elliptical	20+ min if pain-free
Single-Leg Balance with Perturbations	3x30 sec/leg

Week 9-12: Transitional Phase

Focus: Functional movement, sub-max sport drills

if you have a patient whose goals are not centered on running and jumping, tailor functional activity to their goals

Exercise	Frequency
Continue Strength Program	3-4x/week
Bilateral Jumping (soft surface)	3x5 reps
Box Step Jumps (double leg up/down)	3x5 reps
Agility Ladder Drills	2x/week
Plyometric Squat Jumps (if cleared)	3x5 reps
Resisted straight plane walking/backpedaling	3x5 reps
