

## ACL Reconstruction/MCL Reconstruction

The Gundersen Sports Medicine ACL Reconstruction with MCL Reconstruction Rehabilitation Program is an evidence-based and soft tissue healing dependent program allowing patients to progress to vocational and sports-related activities as quickly and safely as possible. Individual variations will occur depending on surgical technique and the patient's response to treatment. Please contact us at 1-800-362-9567 ext. 58600 if you have questions or concerns.

**Early utilization of NMES highly recommended and encouraged with 2x4", ideally 3x5" stim pads.**

**Early isolated OKC resisted knee extension should be implemented depending on patient tolerance- ie no increase in PF pain/joint effusion.**

If a meniscus repair is performed in conjunction with the ACL reconstruction, follow meniscus repair WB restrictions (stable or unstable), ROM 0-90 for 2 wk, no squatting >90 for 4 months, as can be seen in meniscus repair protocol.

Phase I: 0-6 weeks	Immediate post op maximum protection phase
<b>Goals</b>	<ul style="list-style-type: none"> <li>• Protect anatomic repair</li> <li>• Minimize knee joint effusion</li> <li>• Gently increase ROM per guidelines, emphasis on extension full ASAP</li> <li>• Encourage quadriceps function</li> <li>• Prevent negative effects of immobilization</li> </ul>
<b>ROM</b>	<ul style="list-style-type: none"> <li>• wk 0-2: 0-90 deg</li> <li>• wk 2-6: 0-120 deg</li> </ul>
<b>WB</b>	<ul style="list-style-type: none"> <li>• wk 0-6: NWB with brace locked into extension</li> </ul>
<b>Precautions</b>	<ul style="list-style-type: none"> <li>• Emphasis on regaining extension ROM ASAP to decrease stress to the PF joint during ambulation.</li> </ul>
<b>Modalities</b>	<ul style="list-style-type: none"> <li>• Cryotherapy 15 minutes in duration 3x/day</li> <li>• IFC for pain/effusion if needed</li> <li>• <b>NMES quadriceps ASAP in varying positions using 2x4" but ideally 3x5" pads</b> <ul style="list-style-type: none"> <li>○ <b>Long sitting QS/SLR/SAQ</b></li> <li>○ <b>Short sitting LAQ isometrics into strap vs isotonic with resistance</b></li> <li>○ <b>Standing TKE with TB or CC resistance</b></li> </ul> </li> </ul>
<b>Treatment Recommendations</b>  Guidelines for progression based on tolerance	<ul style="list-style-type: none"> <li>• Active warm-up: bike (well leg biking 1-6 wks) or Nustep per ROM guidelines with no resistance</li> <li>• ROM: Wk 0-2: Gentle stretching to attain full extension and 90 degrees of flexion. Emphasis on full return of knee extension ASAP.               <ul style="list-style-type: none"> <li>Low-load long duration stretching for extension with heat if needed (1<sup>st</sup> TERT= Total End Range Time)</li> <li>Manual stretching for extension with overpressure or recurvatum</li> <li>Patellar mobilizations</li> <li>PROM / AAROM / AROM</li> <li>Wk 2-6: progress range of motion 0-120 deg</li> </ul> </li> <li>• Flexibility exercises for hamstring, gastroc-soleus</li> <li>• Scar tissue massage</li> </ul>

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<p>Adequate pain control No excessive swelling SLR without a quadriceps lag</p>	<ul style="list-style-type: none"> <li>• Therapeutic exercises. Exercise in a pain-free manner. Encourage quadriceps activation. <ul style="list-style-type: none"> <li>wks 1-6 Biofeedback QS, SLR <ul style="list-style-type: none"> <li>Short arc 0-30 quadriceps with biofeedback with no weight</li> <li>Hip NWB: 4 way SLR, sidelye resisted ER</li> <li>Gastroc soleus strengthening NWB</li> <li>Hamstring curls 0-90 deg</li> <li>Core stability and upper body exercises if desired</li> </ul> </li> </ul> </li> <li>• IFC for pain/effusion, NMES for quadriceps activation and control as needed</li> <li>• Ice (in stretch for extension if needed) 2<sup>nd</sup> TERT</li> <li>• HEP for 3<sup>rd</sup> TERT</li> </ul>
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<b>Phase II: 6-12 weeks</b>	<b>Moderate protective phase</b>
<b>Goals</b>	<ul style="list-style-type: none"> <li>• Progress ROM as tolerated</li> <li>• Progress WB (per MD approval) and promote a normal heel-toe walking program</li> <li>• Gradual progression of therapeutic exercises for strengthening, stretching, and balance</li> </ul>
<b>ROM</b>	<ul style="list-style-type: none"> <li>• wk 6+: progress to full ROM as tolerated. Goal of full ROM by 8-12 weeks</li> </ul>
<b>WB</b>	<ul style="list-style-type: none"> <li>• Wk 6-8: WBAT per MD. Brace unlocked for ambulation if good SLR without lag.</li> <li>• Utilize crutches as needed until patient demonstrates a normal heel-to-toe pattern.</li> </ul>
<b>Brace</b>	<ul style="list-style-type: none"> <li>• Patient will use the post-op brace until wk 7-8. Replace with a functional ACL brace.</li> </ul>
<b>Modalities</b>	<ul style="list-style-type: none"> <li>• Cryotherapy 15 minutes in duration 1-2x/day</li> <li>• IFC for pain/effusion if needed</li> <li>• NMES quadriceps if needed</li> </ul>
<b>Precautions</b>	<ul style="list-style-type: none"> <li>• No WB stretching into flexion until 8 wks</li> <li>• Avoid descending stairs reciprocally until adequate quadriceps control and lower extremity alignment</li> </ul>

<p><b>Treatment Recommendations</b></p> <p>Guidelines for progression based on tolerance</p>	<ul style="list-style-type: none"> <li>• Active warm-up: Bike (with no resistance weeks 7-9) with resistance (weeks 10+), Nu Step, Treadmill walking (weeks 9+), Aquajogging (weeks 9+) wk 12: Elliptical Trainer</li> <li>• Stretching for full extension and flexion PROM / AAROM / AROM Patellar mobilizations if needed Manual stretching for extension and flexion Low-load long duration stretching with heat if needed (1<sup>st</sup> TERT= Total End Range Time) wk 8: WB knee flexion stretch on leg press with light resistance</li> <li>• Flexibility exercises for hamstring, gastroc-soleus, iliopsoas, quadriceps if indicated</li> <li>• Therapeutic exercises: Exercise in a pain-free manner. Gradual progression with avoiding medial collapse during strengthening and functional activities (focus on hip abductor and external rotator strengthening). Incorporate total leg strengthening and balance / proprioception exercises. Biofeedback QS SLR, CKC knee extension Hip 4 way SLR Hamstring OKC isotonic , double leg bridge Beginning cord exercises (week 7+) CKC exercises: Progress from 0-60 deg to 0-90 deg: leg press (DL) (double leg), wall squats, lateral step-overs, step-ups, bridges wk 8: Resisted sidestep with T-band, leg press (DL) 1:1, partial lunges with UE support as needed wk 9: Progress to squats to 90 deg, BOSU partial squat 0-60 prone hamstring curls, Stair master wk 10: Progress to full lunges, leg press (SL), Deadlift Gastroc soleus strengthening Total leg strengthening Balance / Proprioception training: Double leg progress to single leg, static progressing to dynamic activities CV conditioning / Core Stability</li> <li>• Ice (in stretch if needed) 2<sup>nd</sup> TERT</li> <li>• HEP for 3<sup>rd</sup> TERT if needed</li> </ul>
<p>Independent strengthening</p>	<p>wk 12-16: Progress to independent strengthening program with monthly or bimonthly rechecks if good ROM, minimal effusion or pain, and good muscle control</p>

<b>Phase III: 12+ wks</b>	<b>Advanced strengthening and Gradual Return to activity phase</b>
<b>Goals</b>	<ul style="list-style-type: none"> <li>• Progress muscle strength, endurance, and balance activities. Ideally 3x/week of exercises at a fitness center, step-down, or home program</li> <li>• Progress to higher level activities depending on functional demands and MD approval</li> <li>• Return back to vocational, recreational, and sport activities</li> </ul>
<b>Brace</b>	<ul style="list-style-type: none"> <li>• Your MD may recommend continuing with the knee brace to be used until 12 months from your surgery for higher level activities</li> </ul>
<b>Modalities</b>	Cryotherapy 15 minutes 1x/day or after strenuous activity
<b>Treatment Recommendations</b>	<ul style="list-style-type: none"> <li>• Active warm-up: Bike, Elliptical Runner, Nu Step, Treadmill walking, Stair Stepper</li> <li>• Continue with stretching and flexibility exercises as needed</li> <li>• Strengthening and endurance exercises: Advance as tolerated with emphasis on functional strengthening. Avoid medial collapse during strengthening and functional activities. <ul style="list-style-type: none"> <li>Total leg strengthening</li> <li>Single leg strengthening</li> <li>Hip strengthening</li> <li>Heel raises</li> <li>Hamstring full ROM isotonic.</li> <li>Quadriceps isotonic in ROM without chondrosis, if needed</li> <li>CKC exercises: Leg press, multiple direction lunges, step-ups, squats</li> <li>Gastroc soleus exercise</li> <li>Isokinetic quadriceps/hamstrings in ROM without chondrosis</li> </ul> </li> </ul>
<b>Return to running</b>	<ul style="list-style-type: none"> <li>• Dynamic balance exercises</li> <li>• Foot placement drills submax (16 weeks): agility ladder / line jumps /submax anterior-lateral hop to stabilization</li> <li>• CV conditioning and core stability</li> <li>• Wk 16: (4 months): Return to running program if meets criteria – see next page</li> </ul>
<b>Return to sport</b>	<ul style="list-style-type: none"> <li>• 5 months: Plyometric program – submax with gradual progression</li> <li>• 6-9 months: Return to play if meets criteria – see next page</li> <li>• Golfing, outdoor hiking, biking (16 weeks)</li> </ul>

## ACL Reconstruction/MCL Reconstruction

### Testing and Return to Running/Sports Recommendations

#### Testing:

#### 12 weeks (3 months)

SL 60 deg Stork test

Hip strength:

Abduction MMT

Hip Abduction Side plank test

Biodex test :

30 deg block

2 speeds: 180 deg/sec (5 reps) 300 deg/sec (30 reps)

Y balance test

FOTO

#### 16 weeks (4 months) – RETURN to RUNNING

Repeat previous tests not passed

Anterior lateral hop to stabilization

Trial of running.

Jump test: no arm swing – submax for apprehension/technique

Single Hop test: no arm swing- submax for apprehension/technique

#### 20 weeks (6 months)

Biodex test: Full ROM with no ext block

3 speed test: 60 deg/sec (5 reps),  
180 deg/sec (5 reps),  
300deg/sec (30 reps)

Single Hop test: no arm swing

Triple hop/Cross over hop test: arm swing-

Tuck Jump or Landing Assessment

Agility Test: LEFT test components or time

FOTO

#### Return to Running Criteria:

##### Return to Running Requirements:

Time: at least 4 months post-op

MD / PT clearance

No knee joint effusion

ROM: limb symmetry:

extension within 5 deg

flexion within 10 deg

Biodex:

Limb symmetry of PT:

Quad: 75%

Hams: 80-90%

Proper running form: Treadmill running (6-10 mph, 5 min) with equal audibly rhythmic foot strike

Anterior lateral hop to stabilization drill

completed with no apprehension and good movement control

##### Return to Running Recommendations:

Biodex:

180 deg/sec:

Quad PT/BW: Males: 65%

Females: 55%

H/Q ratio: 65%

300 deg/sec:

Quads Power :Limb symmetry:75%

Hams Power: Limb symmetry: 75%

SL 60 deg stork test:

Limb symmetry: 90%

Hip Abduction Side Plank test:

Level II or greater

Y balance: Limb symmetry: < 4cm

## ACL Reconstruction/MCL Reconstruction

### Testing and Return to Running/Sports Recommendations

#### **Return to Play Criteria:**

##### **Return to Play Requirements:**

Time: at least 6-9 months

MD/ PT clearance

No knee joint effusion

ROM: limb symmetry:

    extension within 5 deg

    flexion within 10 deg

Biodex:

    Limb symmetry of PT:

        Quad: 90%

        Hams: 90%

Tuck Jump or Landing Assessment: no faulty movement patterns

Single Hop test: Limb symmetry: 90%,

Triple Hop test or Cross-Over Hop Test Limb symmetry: 90%

LEFT test or Agility Test with no compensation

##### **Return to Play Recommendations:**

Biodex:

60 deg/sec:

    Quad PT/BW: Males: 100%

                    Females: 80%

    Hams PT/BW: Males: 60%

                    Females: 60%

    H/Q ratio: 60 deg/sec : 60%

                    180 deg/sec: 70%

                    300 deg/sec: 80%

300 deg/sec:

    Quads Power : Limb symmetry:90%

    Hams Power: Limb symmetry: 90%

Hip Abduction Side Plank test:

    Level III or greater

Y balance: Limb symmetry: < 4cm