Meniscus Repair Rehabilitation Program
Root Repair / Unstable Repair

The Gundersen Sports Medicine Meniscus Repair 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. **WB will be restricted for 6 weeks to avoid overstressing the healing tissue.** Individual variations will occur depending on surgical technique and the patient's response to treatment. **This program is outlined for mid body and posterior horn repairs of the meniscus** (for anterior horn repairs limit excessive extension initially).

If an **ACL Reconstruction and Meniscus Repair** are performed, limit ROM 0-90 for 2 weeks and then progress to full passively. No weightbearing flexion for 6 weeks. No squatting >90 for 4 months. Otherwise follow ACL protocol. Return to play will be 9-12 months.

Please contact us at 1-800-362-9567 ext. 58600 if you have questions or concerns.

Phase I: 0-6 weeks	**Immediate post op maximum protection phase**
Goals	• Protect anatomic repair • Minimize knee joint effusion • Gently increase ROM, emphasis on extension • Encourage quadriceps function • Prevent negative effects of immobilization
ROM / Brace	• Wk 0-2: 0-90 deg • After 2 wk, progress ROM as tolerated in NWB position with goal of full by 6-10 weeks but ideally ASAP. Knee flexion motion with WB should be discouraged until after 6 weeks. • Patient will use the post-op brace until wk 7-8.
WB	• wk 0-6: NWB with brace locked into extension
Precautions / Guidelines	• Must follow the WB restrictions as mentioned above to protect the healing meniscus. • Encourage AROM in NWB to promote healing, prevent atrophy of soft tissue and bone, and prevent a decrease in collagen content in the healing meniscus which occurs with immobilization. Early AROM does not affect the tensile properties of the meniscus. • Emphasis on regaining extension ROM ASAP as this is the most stable position for the meniscus and will decrease stress to the PF joint during ambulation. • No isolated resistance to knee flexion for 6 weeks secondary to the semimembranosus attachment to the medial meniscus / popliteus to the lateral meniscus. • Avoid twisting and pivoting motions for 10-12 weeks to minimize shear forces. • Avoid deep squatting (>90 deg) until 4-6 months
Modalities	• Cryotherapy 15 minutes in duration 3x/day • IFC for pain/effusion if needed • NMES quadriceps if needed

Phase I: 0- 6 weeks Maximum protection phase

Meniscus healing phases: (Based on canine study)
- wk 2: Fibrin clot
- wk 5: Meniscal regeneration
- wk 10: Complete vascular healing
- wk 24 (6 months): Complete scar remodeling

Treatment Recommendations Guidelines for progression based on tolerance Visits may be decreased if ROM progressing well, SLR w/out a lag, no excessive swelling or pain	• Active warm-up • ROM: Gentle stretching to attain full extension and gradual return of flexion. Progress as tolerated. Emphasis on full return of knee extension ASAP. Low-load long duration stretching for extension with heat if needed (1st TERT= Total End Range Time) Manual stretching for extension with overpressure or recurvatum Patellar mobilizations PROM / AAROM / AROM • Scar tissue massage / tissue effleurage to decrease sensitivity • Flexibility exercises for hamstring, gastoc-soleus • Consider Personalized Blood Flow Restriction to decrease muscle atrophy • Therapeutic exercises. Gentle strengthening protecting the healing meniscus. Exercise in a pain-free manner. Encourage quadriceps activation. No isolated resisted knee flexion. Posterior chain extensibility exercises if indicated. wks 1-6 Biofeedback QS, SLR Short arc 0-30 quadriceps with biofeedback Gastroc soleus strengthening NWB Hip strengthening NWB: 4 way SLR, sidelye resisted ER Hip circles for posterior chain extensibility Core stability exercises if desired ASLR kettlebell for core activation, ASLR core with rotation, Hollow holds, hollow holds with rotation, dead bugs with lat activation, TGU to elbow • IFC for pain/effusion, NMES for quadriceps activation and control as needed • Ice (in stretch for extension if needed) 2nd TERT • HEP for 3rd TERT

Phase II: 6-12 weeks	Moderate protective phase
Goals	• Minimize knee joint effusion • Progress ROM as tolerated • Progress WB and promote a normal heel-toe walking program • Gradual progression of therapeutic exercises for stretching, neuro-muscular control, strengthening, and balance
ROM / WB / Brace wks 7-8 D/C brace	• Progress ROM as tolerated with goal of full ROM by 8-10 weeks • WBAT with brace unlocked for ambulation if good quadriceps control. Utilize crutches as needed until patient demonstrates a normal heel-to-toe pattern.
Modalities	• Cryotherapy 15 minutes in duration 1-2x/day • IFC for pain/effusion / NMES quadriceps if needed
Precautions / Guidelines	• No WB stretching into flexion until 8 wks • Proximal control (core and hip) to prevent medial collapse/knee valgus • Correct asymmetrical loading patterns: off-set stance, uni-lateral load, RNT, 2:1 to single leg progression • Avoid twisting and pivoting motions for 10-12 wks to minimize shear forces • **Avoid deep squatting (> 90 degrees) until 4-6 months**
Treatment Recommendations Guidelines for progression based on tolerance	• Active warm-up: Bike w/ resistance, Treadmill walking, wk 9-10: ER • Stretching for full extension and flexion Patellar mobilizations if needed wk 8: WB knee flexion stretch on leg press with light resistance • Flexibility: hamstring, gastoc-soleus, iliopsoas, quadriceps if indicated • 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 and N-M control). Incorporate total leg strengthening and balance / proprioception exercises. Core strengthening exercises. CKC knee extension Hip strengthening Quadriceps OKC isotonics short arc with progression to full ROM Hamstring OKC isotonics 0-90 deg in seated position with light resistance (15 reps/set initially). Progress to prone at wk 9, progress to physioball wk 12. Total leg strengthening CKC exercises: Progress from 0-60 deg to 0-90 deg: leg press, wall squats, lateral step-overs, sit to stands, step-ups/step-downs, bridges, lateral hip hinge with medial reach, lateral hip hinge with lateral press, bridging with lat activation wk 7: leg press 2:1, partial BW squats and partial lunges with UE support as needed wk 8: Resisted sidestep with T-band, leg press 1:1, partial dead lifts, wk 9: Progress to full lunges, squats to 90 deg, posterior max lunge, squat and release, prone hamstring curls wk 10: Isokinetic quadriceps / hamstrings VSRP 150-300 deg/sec submax to max, progressing to 90 deg/sec Balance / Proprioception training: Double leg progress to single leg, static progressing to dynamic activities Core Strengthening: Pallof press, dead bug chop/lift

Phase III: 12+ wks	Advanced strengthening and Gradual Return to activity phase
Goals	• Progress muscle strength and N-M control, endurance, balance activities. Ideally 3x/wk exercises at a fitness center, step-down, or home program • Progress to higher level activity depending on demands and MD/PT approval • Initiate a return to running program at 4 months if passes criteria and has no compensations with running pattern. • Initiate working on landing mechanics and agility drills at 4-5 months if passes criteria • **Return back to vocational, recreational, and sport activities at 6-9 months if passes criteria. Sports progression may take 2-4 weeks for full clearance back to full competition**
Brace	Your MD may recommend a knee sleeve or functional brace to be used until 12 months from your surgery for higher level activities
Modalities	• Cryotherapy 15 minutes 1x/day or after strenuous activity
Precautions/ Guidelines	• Correct asymmetrical loading patterns: off-set stance, uni-lateral load • Address fear avoidance behaviors with graded exercise progression, cuing, positive reinforcement, referral if necessary • No deep squatting until 4-6 months
Treatment Recommendations **Return to Running Benchmarks:** 4 months Passes testing criteria - See next page **Return to Landing Drills Benchmarks:** 4 months Passes testing criteria - See next page **During Landing drills: Focus on:** 1.Soft landing with knee flexion > 30 deg 2. no medial collapse/knee valgus 3. no hip IR/ pelvic drop 4. Dynamic postural control	• Active warm-up: Bike, Elliptical Runner, Treadmill walking, • Continue with stretching and flexibility exercises as needed • Strengthening / N-M control / endurance exercises: Focus on strengthening and N-M control activities. Advance as tolerated with emphasis on functional strengthening. Avoid dynamic valgus during strengthening and functional activities. Progress with balance / proprioception exercises. Progress agility drills and working on landing mechanics. Progress to sports specific activities. Total leg strengthening: hip/quadriceps/hamstring Hip strengthening – neuromuscular control to prevent knee valgus Core strengthening – prevent frontal plane trunk lean during landing Single leg strengthening CKC exercises: lunge progression, squat progression, step-up/downs Hamstring full ROM isotonics. Add in physioball HS curls Quadriceps isotonics in ROM without chondrosis Isokinetic quads/hams 0-full flexion if minimal chondrosis Balance exercises: Single leg, progress to dynamic and reactive • Wk 12-14: if adequate strength scores (quads 75%, hamstrings 75%), add in sub-max foot placement drills, anterior lateral hop to stabilization, skaters to prepare for **return to running at 4 months** • **4 months**: Continue with strengthening and dynamic balance. Start running program. Progress to the following exercises if clinically appropriate Landing drills: Low amplitude sub-max drills: Shallow jump landings, double to single line jumps, hopping progress to higher level if meets criteria (see sidebar) Agility drills: Low amplitude sub-max drills: Skipping F/B, jogging F/B, skaters, carioca, agility ladder. • **5 months to 6 months**: Continue with strength and control drills related to sports specific movements. Progress with: Landing drills/ jump hopping drills Agility drills: progress to higher level with speed and complexity: agility ladder drills, cutting/pivoting (changing directions), changing speeds, anticipated to un-anticipated • **6 months+**: possible clearance for return to sport, depending on testing see next page for testing algorithm

Meniscus Repair Rehabilitation Program
Testing and Return to Running/Sports Recommendations

Testing:

12 weeks (3 months)

SL 60 deg Stork test

Hip strength:

- Abduction MMT or dynamometry
- Hip Abduction Side plank test

Biodex test :

- No block
- 2 speeds: 180 deg/sec (5 reps) 300 deg/sec (30 reps)

Y balance test

Deep squat WB symmetry: 2D video or force plate

FOTO

16 weeks (4 months) – RETURN to RUNNING –

See benchmarks

Repeat previous tests not passed

Anterior lateral hop to stabilization

Trial of running.

Landing assessment

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

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

Return to Landing Drills Benchmarks:

1.Time: at least 4 months

2.MD/ PT clearance

3.No knee joint effusion

4.Biodex: Limb symmetry of PT:

Quadriceps and hamstrings: 80-90% = sub-max landing drills

Quadriceps and hamstrings: 90% = max landing drills

***Minimize the following 4 variables with landing drills:**

1. Stiff landing (<30 deg knee flexion)
2. Knee valgus
3. Hip IR / pelvic drop
4. Decreased dynamic balance

Return to running and return to play depends on:

Timeframe from surgery

Test performance

MD and PT approval

Return to Running Benchmarks:

1.Time: at least 4 months post-op

2. MD / PT clearance

3. No knee joint effusion

4. ROM: limb symmetry: extension within 5 deg
flexion within 10 deg

5. Biodex:

Limb symmetry of PT:

Quad: 75%

Hams: 75%

6. Anterior lateral hop to stabilization drill completed with no apprehension and good movement control

7. Proper running form: treadmill running (sub-max at self selected speed)

Recommendations:

1.Biodex:

Quad PT/BW:

Males: 75%, 50% at 180,300deg/sec

Females: 65%, 35% at 180,300deg/sec

H/Q ratio: 65%, 90% at 180,300deg/sec

Total work at 300 deg/sec:

Quad: limb symmetry 75%

Hams: limb symmetry:75%

2. SL 60 deg stork test:

Limb symmetry: 90%

3. Hip Abduction Side Plank test:

Level II or greater

4. Squat WB symmetry with near equal WB

5. Y balance: Limb symmetry: < 4cm

Meniscus Repair Rehabilitation Program
Testing and Return to Running/Sports Recommendations

24 weeks (6 months)

Repeat previous tests not passed
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
Landing assessment:
Jump test: no arm swing
Single Hop test: no arm swing
Triple hop/Cross over hop test: arm swing
Agility test: LEFT test components or time

9 months / 1 year / 2 years

Knee ROM
Biodex test: Full ROM with no ext block
3 speed test: 60/180/300 deg/sec (5/5/30 reps)
Hip MMT or hand held dynamometry
Abduction Side Plank test
Landing Assessment
Single Hop test
Triple Hop test/Cross Over Hop: arm swing
Agility test: LEFT test components or time

Return to running and return to play depends on:

Timeframe from surgery
Test performance
MD and PT approval

Return to Play Benchmarks:

1. Time: at least 6-9 months
2. MD/ PT clearance
3. No knee joint effusion
4. ROM: limb symmetry: extension within 5 deg, flexion within 10 deg
5. Biodex: Limb symmetry of PT 90% quad and hams
6. Landing Assessment: no faulty movement patterns
7. Single Hop test: Limb symmetry: 90%,
8. Triple Hop test or Cross-Over Hop Test Limb symmetry: 90%
9. Agility Testing with no compensation

Recommendations:

1. Biodex:
    i. *Quad PT/BW: (+/-5%)
        1. Males: 95%, 75%, 50% at 60, 180, 300 deg/sec
        2. Females: 85%, 65%, 35% at 60,180,300 deg/sec
    ii. H/Q ratio: (+/- 5%)
        1. 65%, 75%, 90% at 60, 180, 300 deg/sec
    iii. Hams PT/BW: (+/- 5%)
        1. Males: 60%, 35%, 25% at 60, 180, 300 deg/sec
        2. Females: 60%, 35%, 25% at 60, 180, 300 deg/sec
    iv. Total work: 300 deg/sec
        1. Quads: Limb symmetry:90%
        2. Hams: Limb symmetry: 90%
2. Hip HHD 90% ABD/ER/extension
3. Y balance: Limb symmetry: < 4cm
4. Jump test:
    i. Males: 90%-100% height
    ii. Females: 80%-90% height
5. Single hop test:
    i. Males: 80-90% height
    ii. Females: 70-80% height

Return-to-Sports Progression:
(2-4 wk, depends on tolerance)

Step 1:
1-on-1 drills (non-contact) sport specific
Step 2:
1-on-1 drills (contact) full speed sport specific
Step 3:
Team scrimmage (non-contact)
Step 4:
Team scrimmage no restrictions
Step 5:
Game activities with restricted playing time
Step 6:
Game activities with no restrictions

Meniscus Repair Program References

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