Rehabilitation Guidelines for Meniscus Repair

What is the Meniscus?

The meniscus is a crescent-shaped, fibrocartilaginous structure that:

- ✓ Distributes load
- ✓ Absorbs shock
- ✓ Provides stability and congruency to the knee joint
- ✓ Reduces knee joint friction
- ✓ Provides nutrition to the knee joint

The meniscus is composed of different components: collagen, matrix, and water, all of which help to resist compression and axial loading of the knee joint. The meniscus is wedge-shaped which allows axial / compressive loads to be uniformly distributed through the knee joint, and to minimize contact pressure on knee joint surfaces. Lastly, the meniscus functions as a secondary stabilizer of the knee joint: the medial meniscus helps minimize anteroposterior translation of the knee, while the lateral meniscus helps resist rotary motion.

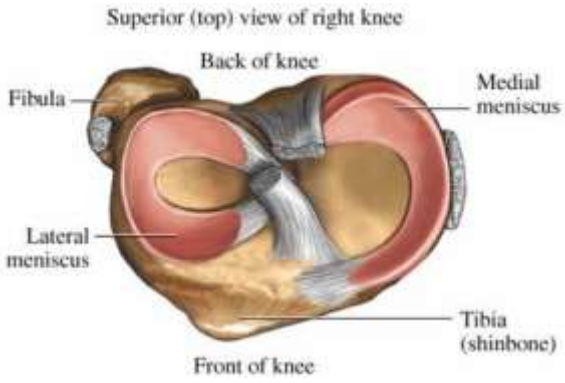

Image 1: Anatomy of the Knee

The inner-third of the meniscus functions primarily to disperse axial / compressive forces, while the outer two-thirds of the meniscus function primarily to mitigate tensile forces.

The meniscus is comprised of two fiber types: circumferential and radial. Circumferential fibers run parallel to the joint surface along the circumference of the meniscus. This fiber orientation creates a “hoop stress” effect that helps uniformly disperse compressive loads through the knee joint. Radial fibers on the other hand, run from the center to the meniscus outward, and work to counteract the forces of the circumferential fibers.

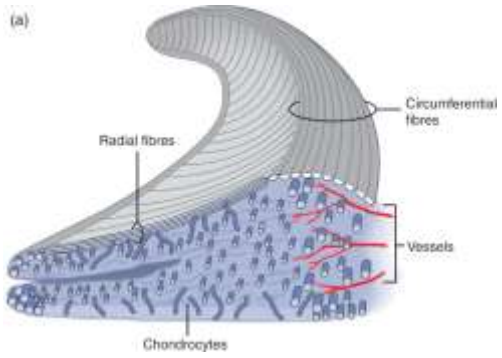

Image 2: Fibers of the meniscus

Mechanism of Injury

An isolated meniscus injury can occur due to rotational and/or shear stress through the knee joint. This can happen when high axial / compressive loads are placed on the meniscus, along with a component of rotational force. This can happen with rapid acceleration or deceleration, change in direction, jumping, or any quick twisting motion. Meniscal injury can result from acute trauma or repetitive load, and can often be seen with damage to other ligamentous structures in the knee, most commonly the anterior collateral ligament (ACL) and/or medial collateral ligament (MCL). When there are degenerative/repetitive changes in the meniscus, less force is required to cause injury. This is mostly common present in athletes older than 40 years of age and is often accompanied by knee joint arthritis. Due to the role of the meniscus, meniscal injury can often result in altered biomechanics of the knee joint that can further increase degeneration and early onset of knee osteoarthritis.

Occupations that require squatting and kneeling, infantry-related duties, and sports with cutting and pivoting (ie: soccer, football, basketball, rugby, and wrestling) can have an increased risk

for meniscal injury. Males and those greater than 40 years of age also have an increased risk of injury. The medial meniscus is more commonly injured when compared to the lateral meniscus, likely due to its decreased mobility and connection/articulation with the MCL.

About Meniscus Repairs

As the meniscus functions to distribute load, absorb shock and provide knee joint stability, any deficiency in the meniscus can lead to accelerated degenerative changes in the knee. If this meniscal damage is not addressed, meniscal injury has the potential to lead to chondral lesions at the knee and an associated reduction in patient / athlete function.

When torn, meniscal tears are classified based on depth, location, tear pattern, length, tissue quality, and percentage of meniscus involved. Tear types include radial, longitudinal vertical, longitudinal horizontal tears, flap or parrot-beak tears, and bucket handle tears or complex tears.

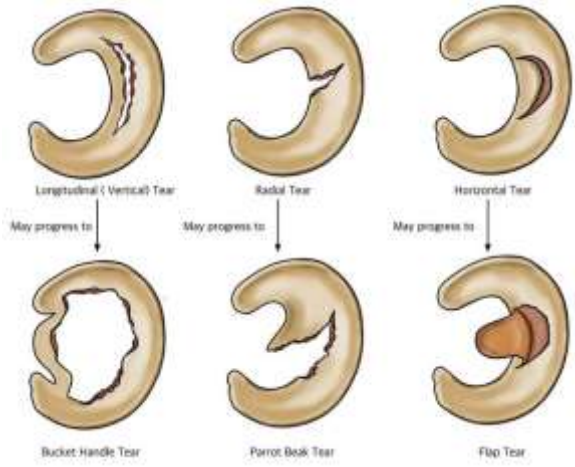

Image 3: Types of Meniscus Tears

Diagnosing a Meniscus Tear

If the injury is acute, a patient will typically hear or feel a "popping" sensation in the knee and will likely notice immediate swelling of the knee. If the injury is more degenerative in nature, knee pain and symptom presentation can come on gradually, and may include feelings of "locking and catching" and even instability. The patient will likely have tenderness at the medial (inside) or lateral (outside) knee joint line, and may present with limitations into knee joint flexion and extension range of motion. Specific clinical tests used to assess for meniscal injury include: Thessaly's, McMurray's, or Apley's compression test. These tests load the meniscus while putting shear/rotational stress on the fibrocartilage and will likely provoke pain or symptoms of locking and catching.

Treatment Options for a Meniscus Injury

When a meniscus injury is diagnosed, various high-quality treatment options exist including: non-operative treatment, partial meniscectomy, meniscal repair, or meniscal transplant. Treatment selection will be based on a variety of patient factors including patient age, degree of injury, location of injury, type of meniscus tear (if present), and patient activity goals.

If a surgical intervention is indicated, your surgeon will consider various factors including tear type and location to determine the most ideal surgical plan for you.

The meniscus has three distinct zones:

- Red zone = the outer third with the most blood supply
- Red-white zone = the middle third with a moderate blood supply
- White zone = the inner-most third with limited / no blood supply.

If the tear is in or closer to the red zone, it has better healing potential and prognosis with a **direct meniscal repair**.

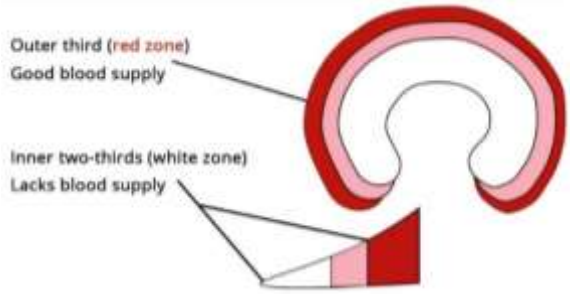

Image 4: Red, red-white, and white zones of the meniscus

Rehabilitation Guidelines for Meniscus Repair

Direct meniscal repair is the superior choice in these cases as the meniscus functions to preserve the load-dissipating function of this tissue, and thus promote positive long-term outcomes for athlete knee function. A meniscal repair is typically done arthroscopically (all inside the knee). The surgeon will make several small incisions in the knee and insert a small scope (camera) and surgical instruments into the knee joint to visualize and repair the torn meniscus. A meniscal repair requires longer return to function and activity secondary to specific post-operative precautions to protect the healing tissue. Proposed timeline for full return to high-level sport is 6-9 months depending on activity / sport.

A **partial meniscectomy** is considered when a patient/athlete has a meniscal injury and has been unsuccessful in the non-operative management of this condition, or presents with a symptomatic, torn meniscus with low / limited healing potential if repaired. A partial meniscectomy involves the removal of the injured / torn meniscal tissue. Partial meniscectomies can alter the biomechanics of the knee joint, and potentially result in early risk of knee joint osteoarthritis, chronic symptoms, and the potential need for a more significant meniscal removal. A partial meniscectomy does tend to result in a quicker return to activity / sport with a proposed timeline of returning to high level sport in 4-6 months.

A **meniscal transplant / allograft** procedure is a surgical technique performed in attempt to restore normal knee biomechanics by inserting cartilage from a cadaver knee and sewing it into place in the injured knee. This treatment option is for those who do not have an anatomic meniscus. Reaching full range of motion, strength, graft healing, and return to activity / sport following a meniscal transplant takes longer than for a meniscal repair or a partial meniscectomy. About 75% of athletes can return to sport after a meniscal allograft at 12 months post-operatively if participating in lower impact sports like yoga, swimming, cycling, or weightlifting.

Urgency to return to play, preservation of performance and knee function as well as functional longevity, are all considerations during surgery planning.

Rehabilitation Following Meniscus Repair

Post-operative rehabilitation protocols are dependent on meniscal tear pattern, location and size, quality of repaired tissue, type and strength of repair, and concomitant procedures. It is important to factor strength of repair and security of fixation during surgery into post-operative weight-bearing status. Each rehabilitation will be tailored to tear pattern since each tear patten responds differently to weight-bearing. For example, compression and loading on vertical longitudinal tears contribute to healing of the knee joint whereas loading on a radial tear will cause displacement and separation of the tear and delay healing.

As the surgeon is the one who repairs the tissue and can see the extent of the repair and associated tissue quality, they are best able to determine preference for rehabilitation progressions regarding any precautions.

Immediately after surgery, you will be placed in a knee extension brace and be instructed to be non-weight-bearing. This brace will be locked in extension for the first 4-6 weeks, as regaining extension is imperative in the first few weeks. You will not be completely immobilized as complete immobilization can alter the mechanical environment of the knee, lead to decreased blood flow, and negatively impact meniscal healing.

Unique post-operative considerations:

Stable tears (vertical-longitudinal and bucket-handle tears) compress and experience positive healing factors with controlled weight-bearing. Weight-bearing through the knee joint can help reduce and compress vertical longitudinal and bucket-handle tears, and contribute to improved healing rates in stable tears. As a result, early post-operative weight-bearing along accelerated timelines can promote improved healing. Tears that are smaller in size (< 3 cm) can bear weight

after surgery sooner and gain range of motion quicker compared to tears that are larger in size (> 3 cm).

Unstable tears (radial, root, complex, and flap tears**)** experience more tensile load with weight-bearing and can become separated. As such, it is typically recommended that a patient/athlete be fully non-weightbearing for 6 weeks post-operatively with associated range of motion restrictions. Weight-bearing can impair successful healing of radial, root, and complex tears.

As each patient has different anatomy, it is important to consider patient-specific lower extremity alignment as well. For example, those who have a varus knee posture / deformity (knees bowing out) experience higher compressive loads through the medial meniscus, and those have a valgus knee posture / deformity (knees caving in) experience higher compressive loads through the lateral meniscus. If either knee posture is present with the associated meniscal tear (medial vs lateral), more conservative weight-bearing and range of motion precautions may be recommended.

Knee range of motion must also be progressed serially and intentionally. Increasing angles of knee flexion (bend) results in larger amounts of contact pressure at the knee joint. Large amounts of knee bend should be avoided for about 3 months post-operatively due to these increased meniscal loads.

Return to Sport After Meniscal Repair

Return to sport timelines are directly influenced by the type of meniscal tear, tissue stability and sport-specific / activity goals. Each return to play progression needs to be systematic, pathology dependent, and individualized to the athlete's needs, sport, expectations, and level of play.

Generally, for **stable tears**, there is an average of 4-6 month return to sport for linear sports, and 6-8 month return to sport for contact and pivoting sports. For **unstable tears**, there is typically a 6 month return to linear sports and 9 month return to sport for contact and pivoting sports.

It is imperative to serially assess objective outcomes throughout post-operative rehabilitation to ensure that each patient / athlete is appropriate for load and activity progressions. Early return to sport can lead to higher failure rates overall.

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Rehabilitation Guidelines for Meniscus Repair

Post-operative Rehabilitation Protocol Recommendations for Stable vs Unstable Meniscal Repairs

Stable Repair

Stable meniscus repairs include vertical-longitudinal and bucket-handle tears. These stable repairs can be further classified into small tears (< 3 cm) and large tears (> 3 cm). As stable tears, meniscal and knee biomechanics are preserved, and post-operative rehabilitation can progress slightly faster as weight-bearing has been shown to compress and promote healing of these types of tears.

With further classification into small and large stable tears, your weight-bearing and range of motion progressions may be modified slightly to ensure appropriate protection of the repair. The stable repair protocol outlined in this document is designed for the rehabilitation of general stable meniscal injuries.

Unstable Repair

Unstable meniscus repairs include radial, root, complex, and flap tears. With unstable tears, meniscal and knee biomechanics are disrupted, and post-operative rehabilitation should progress more slowly / conservatively. Weight-bearing can cause separation of the meniscus and thus impair healing of the repair.

Considerations for meniscal tear location (medial versus lateral meniscus) should be made with both stable and unstable meniscal repairs when it comes to load progressions and exercise selection.

*****The protocols outlined in this document is designed for the rehabilitation of general meniscal injuries. When there are additional knee structures involved in surgical repair or reconstruction, or poor meniscal tissue quality is identified, rehabilitation following this injury will need to be adjusted. *****

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Rehabilitation Guidelines for Meniscus Repair

Stable: Phase I (0-6 Weeks) Protection Phase	
Appointments	Surgeon/Physician Assistant follow-up: 1-week post-operative and 6 weeks post-operative Physical Therapy Appointments: ✓ At least 1 visit pre-op for immediate exercise post-op, gait training, and education ✓ 2-3x/week post-op
Rehabilitation Goals	▪ Control edema, initiate good quad activation, prevent stiffness, and prevent atrophy ▪ Achieve full weight-bearing ▪ Discharge from AD
Precautions	Post-op brace: worn at all times until cleared by physical therapist • Locked in full knee extension **weeks 0-4** • Okay to remove for performance of home program as directed by physical therapist Weight-bearing ▪ Non-weightbearing for **weeks 0-2** ▪ 50% weightbearing **weeks 2-4** ▪ Weight-bearing as tolerated **weeks 4-6** **NO** hamstring strengthening for medial meniscus repairs for **4 weeks** **NO** deep squatting (beyond 90° knee flexion) **or** loaded range of motion for **4 weeks**
Range of Motion	Small stable tear (< 3 cm): ▪ 0-90° **weeks 0-4** ▪ 0-120° **weeks 4-6** Large stable tear (> 3 cm): ▪ 0-90° **weeks 0-6** Start with unloaded, open-kinetic chain range of motion
Therapeutic Interventions ***(Examples, but not limited to…)*** ****Consider implementing dual tasking throughout rehab program to minimize compensatory neurocognitive deficits****	Focus on quad activation without gluteal co-activation / reduce quadriceps autogenic inhibition ▪ Consider *pre-treatment* focal cooling and use of transcutaneous electrical nerve stimulation (TENS) - see **Appendix A** for ideal parameters Exercise Examples: ▪ Quad sets (at varying speeds and hold durations) ▪ Straight leg raises (all 4 planes) ▪ Neuromuscular re-education using electrical stimulation (NMES) at 0° and 60° knee flexion (See **Appendix A** for ideal parameters) ▪ Knee flexion: wall slides, heel slides, seated heel slides Small stable tear (< 3 cm): ▪ 0-90° **weeks 0-4** ▪ 0-120° **weeks 4-6** Large stable tear (> 3 cm): ▪ 0-90° **weeks 0-6** Initiate at 2 weeks post-op: Gait training ▪ 50% weightbearing **weeks 2-4** ▪ Weight-bearing as tolerated **weeks 4-6** Initiate at 4 weeks post-op: ▪ Progressive hamstring activation – start with isometric loading ▪ Small range, closed-kinetic chain squat patterns
Criteria for Discharging Crutches/Assistive Device and Progression to Next Rehabilitation Phase	✓ No sooner than **4 weeks** (small stable) or **6 weeks** (large stable) ✓ Full *active* knee extension range of motion ✓ Swelling: ≤1+ on sweep test ✓ Strength: able to perform strong quadriceps activation and perform 2x10 SLR with no extensor lag ✓ Tolerate full weight bearing ambulation with no visible gait deviations

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Rehabilitation Guidelines for Meniscus Repair

Stable: Phase II (6-12 weeks) Strengthening Phase	
Appointments	Surgeon/Physician Assistant follow-up: 12 weeks post-op Physical Therapy Appointments: 1-2x/week
Rehabilitation Goals	▪ Restore *active* knee extension range of motion symmetrical to uninvolved limb, and progress knee flexion mobility ▪ Improve lower extremity strength ▪ Progress balance and neuromuscular control
Precautions	Post-op brace: worn at all times until cleared by physical therapist • Okay to unlock to allow up to 90° knee flexion at **6 weeks** post-op **NO** deep squatting (stay at ≤ 90° knee flexion) until **3 months** post-op Gradual hamstring load progressions with medial meniscus tears
Range of Motion	Small stable tear (< 3 cm): ▪ No ROM restrictions Large stable tear (> 3 cm): ▪ 0-130 knee flexion: **weeks 6-8** ▪ No ROM restrictions: **8+ weeks**
Therapeutic Exercises ***(Examples, but not limited to…)*** ****Consider implementing dual tasking throughout rehab program to minimize compensatory neurocognitive deficits****	Early phase strengthening: consider utilization of blood flow restriction training once joint effusion is well controlled - if no contraindications are present *(appropriate for use with OKC and CKC strength tasks* - see **Appendix A** for ideal parameters*)* • Leg press: progress double to single leg; ≤ 90° knee flexion • Full range OKC knee extension with ankle cuff weights ▪ Partial range with increased load Weeks 6-8: progress load in 90-45° knee flexion (15-20 rep max) Weeks 8-10: progress load in 90-30° knee flexion (15-20 rep max) • Step-ups *(limit compensatory hip / ankle strategies)* • Step-downs *(limit compensatory hip / ankle strategies)* • Bridges • Progressive hamstring loading in closed-kinetic chain (hip hinge/deadlift) • No/low resistance stationary bike Cardio • Bike (if flexion ROM > 120° and joint effusion is well controlled) • Treadmill interval walking (speed and incline progressions) Late phase strengthening: • Loaded OKC knee extension Weeks 10-12: progress load in full ROM (15-20 rep max) Weeks 12-16: progress load in full ROM (10-12 rep max) Week 16: progress to Biodex training if available • Single leg squats • Forward and reverse lunges • Frontal plane strength progressions (multi-direction band walking, lateral lunge progressions, etc.) • Deadlifts Gradual rate of force development progressions Core exercises Gait training
Criteria for Progression to Next Rehabilitation Phase	✓ Full, symmetrical *active* knee extension and *passive* knee flexion range of motion ✓ Swelling ≤ 2+ using sweep test ✓ Able to tolerate closed kinetic chain therapeutic exercise program without increased pain and swelling ≤ 2+ using sweep test ✓ Safely perform marching with 5 second balance

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Rehabilitation Guidelines for Meniscus Repair

Stable: Phase III (12-16 Weeks)	
Appointments	Surgeon/Physician Assistant follow-up: 12 weeks post-op Physical Therapy Appointments: 1/week -> every other week
Rehabilitation Goals and Criteria for Return to Impact / Plyometrics & Running	▪ Achieve adequate strength and functional LE motor control for strength and power training progressions (see **Appendix B)** ▪ Begin linear running
Range of Motion	Full range of motion
Therapeutic Exercises ***(Examples, but not limited to…)*** ****Consider implementing dual tasking throughout rehab program to minimize compensatory neurocognitive deficits****	Progress squat depth / range of motion beyond 90° starting at **12 weeks** post-op Strengthening progressions: (incorporate into team setting as appropriate) Build load, rate of force development and variety of planes of motion (sagittal, frontal, etc) o Initiate open kinetic chain hamstring strengthening **12 weeks** post-op: prone, seated, standing, bridge sliders, etc. Progressive impact training: See **Appendix C** for LE plyometric principles o Double leg impact drills Floor based pogo drills Jump rope o Single leg impact drills Floor based pogo drills Jump rope Jogging/running progressions (sport-specific) o See **Appendix D**
Criteria for Progression to Next Rehabilitation Phase	✓ Full, symmetrical *active* knee extension and flexion range of motion ✓ Swelling ≤ 2+ using sweep test ✓ Able to tolerate introduction of impact / jogging tasks with appropriate gait mechanics and without increased pain and swelling ≤ 2+ using sweep test

Stable: Phase IV (Week 16+) Return to Practice/Sport Phase	
Appointments	Surgeon: 6 month post-op visit Physical Therapy: 1 time/week -> every other week
Rehabilitation Goals and Criteria for Return to Change of Direction Tasks	See **Appendix B** *If patient is not planning on return to sport, discharge from PT once they are able to do agility training at sub-max speeds without new inflammation.*
Criteria for Return to Cutting and Agility	See **Appendix B**
Therapeutic Exercises ***(Examples, but not limited to…)*** ****Consider implementing dual tasking throughout rehab program to minimize compensatory neurocognitive deficits****	▪ Progressive strengthening (in sport team setting if applicable) ▪ Preparation for return to practice: integrate sport-specific jumping, plyometric and linear running / speed tasks o Take into consideration demands of sport including energy systems, player position, and environment ▪ Preparation for return to sport/competition: integrate sport-specific cutting and agility tasks o Consider progressive contact drill preparation as relevant, with change of direction and agility training
Criteria for Return to Sport	✓ Surgeon clearance ✓ See **Appendix B**

***Important to continue participation in ongoing preventative strength, power and motor control exercises at return to sport**

All physical therapy appointment frequencies are recommendations only. Your physical therapy provider will work with you to select an appointment frequency that best fits your individual needs.

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Rehabilitation Guidelines for Meniscus Repair

Unstable: Phase I (0-8 Weeks) Protection Phase	
Appointments	Surgeon/Physician Assistant follow-up: 1-week post-operative and 6 weeks post-operative Physical Therapy Appointments: ✓ At least 1 visit pre-op for immediate exercise post-op, gait training, and education ✓ 2-3x/week post-op
Rehabilitation Goals	▪ Control edema, initiate good quad activation, prevent stiffness, and prevent atrophy ▪ Achieve full weight-bearing ▪ Discharge from AD
Precautions	Post-op brace: worn at all times until cleared by physical therapist • Locked in full knee extension **weeks 0-4** • Okay to remove for performance of home program as directed by physical therapist Weight-bearing ▪ Non-weightbearing for **weeks 0-6** ▪ 50% weightbearing **weeks 6-8** ▪ Weight-bearing as tolerated **weeks 8+** **NO** hamstring strengthening for medial meniscus repairs for **4 weeks** **NO** deep squatting (beyond 90° knee flexion) **or** loaded range of motion for **4 weeks**
Range of Motion	Start with unloaded, open-kinetic chain range of motion ▪ 0-70° for **weeks 0-4** ▪ 0-90° for **weeks 4-6** ▪ 0-125° for **weeks 6-8** *(Consult operative note for surgery specific, staged ROM progressions)*
Therapeutic Interventions ***(Examples, but not limited to…)*** ****Consider implementing dual tasking throughout rehab program to minimize compensatory neurocognitive deficits****	Focus on quad activation without gluteal co-activation / reduce quadriceps autogenic inhibition ▪ Consider *pre-treatment* focal cooling and use of transcutaneous electrical nerve stimulation (TENS) Exercise Examples: ▪ Quad sets (at varying speeds and hold durations) ▪ Straight leg raises (all 4 planes) ▪ Neuromuscular re-education using electrical stimulation (NMES) at 0° and 60° knee flexion (See **Appendix A** for ideal parameters) ▪ Knee flexion: wall slides, heel slides, seated heel slides o 0-70° for **weeks 0-4** o 0-90° for **weeks 4-6** Initiate at 2 weeks post-op: Gait training ▪ 50% weightbearing **weeks 6-8** ▪ Weight-bearing as tolerated **weeks 8+** Initiate at 6+ weeks post-op: ▪ Progressive hamstring activation – start with isometric loading ▪ Small range, closed-kinetic chain squat patterns
Criteria for Discharging Crutches/Assistive Device and Progression to Next Rehabilitation Phase	✓ No sooner **8 weeks** post-op ✓ Full *active* knee extension range of motion ✓ Achieve *passive* knee flexion to 90° ✓ Swelling: ≤1+ on sweep test ✓ Strength: able to perform strong quadriceps activation and perform 2x10 SLR with no extensor lag ✓ Tolerate full weight bearing ambulation with no visible gait deviations

Rehabilitation Guidelines for Meniscus Repair

Unstable: Phase II (8-16 weeks) Strengthening Phase	
Appointments	Surgeon/Physician Assistant follow-up: 12 weeks post-op Physical Therapy Appointments: 1-2x/week
Rehabilitation Goals	▪ Restore *active* knee extension range of motion symmetrical to uninvolved limb, and progress knee flexion mobility ▪ Improve lower extremity strength ▪ Progress balance and neuromuscular control
Precautions	Post-op brace: worn at all times until cleared by physical therapist • Okay to increase allowed range of motion as guided by physical therapist **NO** deep squatting (≤ 90° knee flexion) until **4 months** post-op Gradual hamstring load progressions with medial meniscus tears
Range of Motion	Progress unloaded, open-kinetic chain range of motion ▪ 0-125° for **weeks 8-10** ▪ 0-135° for **weeks 10-12** ▪ Full range **week 12+**
Therapeutic Exercises ***(Examples, but not limited to…)*** ****Consider implementing dual tasking throughout rehab program to minimize compensatory neurocognitive deficits****	Early phase strengthening: consider utilization of blood flow restriction training once joint effusion is well controlled - if no contraindications are present *(appropriate for use with OKC and CKC strength tasks)* • Leg press: progress double to single leg; ≤ 90° knee flexion • Full range OKC knee extension with ankle cuff weights ▪ Partial range with increased load Weeks 8-10: progress load in 90-45° knee flexion (15-20 rep max) • Step-ups ≤ 90° knee flexion *(limit compensatory hip / ankle strategies)* • Step-downs ≤ 90° knee flexion *(limit compensatory hip / ankle strategies)* • Forward and reverse lunges ≤ 90° knee flexion • Progressive hamstring loading in closed-kinetic chain (bridges, hip hinge/deadlift) • No/low resistance stationary bike Cardio • Bike (if flexion ROM > 120° and joint effusion is well controlled) • Treadmill interval walking (speed and incline progressions) Late phase strengthening: • Loaded OKC knee extension Weeks 10-12: progress load in 90-30° knee flexion (15-20 rep max) Weeks 12-14: progress load in full ROM (15-20 rep max) Weeks 14-16: progress load in full ROM (10-12 rep max) Week 16: progress to Biodex training if available • Single leg squats, increase depth • Forward and reverse lunges • Frontal plane strength progressions (multi-direction band walking, lateral lunge progressions, etc.) • Deadlifts Gradual rate of force development progressions Core exercises Gait training
Criteria for Progression to Next Rehabilitation Phase	✓ Full, symmetrical *active* knee extension and *passive* knee flexion range of motion ✓ Swelling ≤ 2+ using sweep test ✓ Able to tolerate closed kinetic chain therapeutic exercise program without increased pain and swelling ≤ 2+ using sweep test ✓ Safely perform marching with 5 second balance

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Rehabilitation Guidelines for Meniscus Repair

Unstable: Phase III (16-20 Weeks)	
Appointments	Surgeon/Physician Assistant follow-up: as needed Physical Therapy Appointments: 1/week -> every other week
Rehabilitation Goals and Criteria for Return to Impact / Plyometrics & Running	▪ Achieve adequate strength and functional LE motor control for strength and power training progressions (see **Appendix B)** ▪ Begin linear running
Range of Motion	Full range of motion
Therapeutic Exercises ***(Examples, but not limited to…)*** ****Consider implementing dual tasking throughout rehab program to minimize compensatory neurocognitive deficits****	Progress squat depth / range of motion beyond 90° starting at **16 weeks** post-op Strengthening progressions: (incorporate into team setting as appropriate) Build load, rate of force development and variety of planes of motion (sagittal, frontal, etc) o Initiate open kinetic chain hamstring strengthening **16 weeks** post-op: prone, seated, standing, bridge sliders, etc. Progressive impact training: See **Appendix C** for LE plyometric principles o Double leg impact drills Floor based pogo drills Jump rope o Single leg impact drills Floor based pogo drills Jump rope Jogging/running progressions (sport-specific) o See **Appendix D**
Criteria for Progression to Next Rehabilitation Phase	✓ Full, symmetrical *active* knee extension and flexion range of motion ✓ Swelling ≤ 2+ using sweep test ✓ Able to tolerate introduction of impact / jogging tasks with appropriate gait mechanics and without increased pain and swelling ≤ 2+ using sweep test

Unstable: Phase IV (Week 20+) Return to Practice/Sport Phase	
Appointments	Surgeon: 6 month post-op visit Physical Therapy: 1 time/week -> every other week
Rehabilitation Goals and Criteria for Return to Change of Direction Tasks	See **Appendix B** *If patient is not planning on return to sport, discharge from PT once they are able to do agility training at sub-max speeds without new inflammation.*
Criteria for Return to Cutting and Agility	See **Appendix B**
Therapeutic Exercises ***(Examples, but not limited to…)*** ****Consider implementing dual tasking throughout rehab program to minimize compensatory neurocognitive deficits****	▪ Progressive strengthening (in sport team setting if applicable) ▪ Preparation for return to practice: integrate sport-specific jumping, plyometric and linear running / speed tasks o Take into consideration demands of sport including energy systems, player position, and environment ▪ Preparation for return to sport/competition: integrate sport-specific cutting and agility tasks o Consider progressive contact drill preparation as relevant, with change of direction and agility training
Criteria for Return to Sport	✓ Surgeon clearance ✓ See **Appendix B**

***Important to continue participation in ongoing preventative strength, power and motor control exercises at return to sport**

All physical therapy appointment frequencies are recommendations only. Your physical therapy provider will work with you to select an appointment frequency that best fits your individual needs.

***Developed by**: Danielle Villaruz PT, DPT & Dr. Christopher McCrum*
***Edited/reviewed by**: Shanon Williams PT, DPT, SCS; Brie Herbst PT, DPT, OCS, SCS; Kaitlyn Schlueter PT, DPT, SCS*
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SAMARITAN ATHLETIC MEDICINE
845 SW 30TH STREET • CORVALLIS, OR 97330