KNEE MENISCUS REPAIR POST-OPERATIVE GUIDELINES

The following Meniscus Repair Guidelines were developed by HSS Rehabilitation. Progression is both criteria-based and patient specific. Phases are designed to give the clinician a general sense of progression but do not replace clinical judgement. Progression through the phases may vary in individuals with concomitant injuries such as degenerative joint disease, patellofemoral pain syndrome, and ligament reconstruction. Timelines for these distinct patient populations will vary greatly, thus achievement of milestones is recommended for advancement to higher level activities such as running, plyometrics, and sports. Patients undergoing this procedure typically present differently depending on tear types. Location and classification of the tear may alter progression throughout the rehabilitation process, so it is strongly recommended that tear type is confirmed prior to initiating treatment and then should be addressed appropriately.

FOLLOW SURGEON MODIFICATIONS AS PRESCRIBED.

KNEE MENISCUS REPAIR POST-OPERATIVE GUIDELINES

Acute Care Phase: Day of Surgery

PRECAUTIONS

- Avoid prolonged sitting, standing, walking
- Avoid painful activities
- Avoid removing brace except for dressing and bathing
- Avoid ambulating without crutches
- Avoid weight bearing without brace and keep brace locked at 0 degrees
    - Adhere to instructed weight bearing status and progression per surgeon
- Do not place a pillow under the operated knee, keep extended when resting and sleeping
- No knee flexion past 90 degrees (if surgeon recommendation differs follow prescription)

ASSESSMENT

- Mental status (alert and oriented x 3)
- Numeric Pain Rating Scale (NPRS)
- Wound status
- Post-anesthesia sensory motor screening
- Functional mobility
- Ability to don/doff brace independently

TREATMENT RECOMMENDATIONS

- Patient education
    - Edema and effusion management
    - Activity modification
    - Brace management: locked in extension at all times
- Transfer training
- Gait training: Adhere to instructed weight bearing status and progression per surgeon with brace locked in extension and assistive device on level surface and stairs
    - See Appendix for further details
- Initiate and emphasize importance of home exercise program (HEP)
    - Passive knee extension with towel roll under heel
        - Per surgeon regarding anterior horn repairs
    - Seated active assisted range of motion (AAROM) per surgeon
        - See Appendix for further details
    - Quadriceps sets, gluteal sets, ankle pumps

CRITERIA FOR DISCHARGE

- Independent with brace management
- Independent transfers
- Independent ambulation with appropriate assistive device and weight bearing status on level surfaces and stairs
- Independent with range of motion (ROM) restrictions
- Independent with HEP

EMPHASIZE

- Control edema and effusion
- Gait training with appropriate device and weight bearing status
- AAROM
- Avoid pillow under knee at rest
- Avoid removing brace except for dressing and bathing
- Quadriceps contraction

MODIFICATIONS TO ACUTE CARE PHASE

- See Appendices for specific recommendations regarding ROM and Weight Bearing (WB)

KNEE MENISCUS REPAIR POST-OPERATIVE GUIDELINES

Post-Operative Phase 1: Weeks 0-6

PRECAUTIONS

- Avoid prolonged sitting, standing, walking
- Avoid painful activities
- Continue to use brace as directed by surgical team
- Continue to following weight bearing instructions as directed by surgical team
- Do not place a pillow under the operated knee, keep extended when resting and sleeping
- Adhere to instructed ROM progression per surgeon
- Avoid active or resisted hamstring exercises

ASSESSMENT

- Lower Extremity Functional Scale (LEFS)
- NPRS
- Wound status
- Edema and effusion
- Passive (PROM)/AAROM of knee
- Patellar complex mobility
- Girth measurement (thigh, joint line)
- Lower extremity (LE) ROM and flexibility
- LE strength
- Quality of quadriceps contraction
- Functional assessment:
    - Transfers, gait, stair negotiation

TREATMENT RECOMMENDATIONS

- Patient education
- Compliance with HEP, weight bearing, and ROM precautions
- Gait: Adhere to instructed weight bearing status and progression per surgeon
    - See Appendix for further details
- Knee PROM/AAROM per surgeon
    - See Appendix for further details
- Patellar complex mobilizations
- LE flexibility (hamstring/gastrocnemius)
- Core stabilization
- Hip progressive resisted exercises (PREs)

- Quadriceps re-education using modalities, as needed: e.g. neuromuscular electrical stimulation (NMES)
- Quadriceps strengthening using modalities, as needed: e.g. blood flow restriction (BFR) with surgeon clearance)
- Straight Leg Raise (SLR) (with brace locked in extension if unable to perform without extension lag)
- Bilateral closed chain LE strengthening from 0-45 degrees
- Balance and proprioception training: progress double leg to single leg Modalities for pain management and effusion, as needed

CRITERIA FOR ADVANCEMENT

- Pain and effusion/edema controlled
- Quadriceps strength: sufficient to perform SLR without extensor lag without brace
- ROM:
    - Full knee extension ROM equal to contralateral side
    - PROM/AAROM knee flexion to 90 degrees
- Gait normalized without assistive device

EMPHASIZE

- Control edema/effusion
- Patellar complex mobilization
- AAROM
- Quadriceps neuromuscular control and strength
- Compliance with HEP

MODIFICATIONS TO POST-OPERATIVE PHASE 1

- See Appendices for specific recommendations regarding ROM and WB

KNEE MENISCUS REPAIR POST-OPERATIVE GUIDELINES

Post-Operative Phase 2: Weeks 7-12

PRECAUTIONS

- Monitor response to load to avoid reactive pain or effusion
- Avoid closed chain end range knee flexion (deep squat, lunge)
- Avoid heavy loaded isolated resisted hamstring exercises
- Avoid running, agility, and plyometrics
- Avoid twisting or pivoting motions

ASSESSMENT

- LEFS
- NPRS
- Effusion/edema
- Scar mobility
- Patellar complex mobility
- Girth measurement (thigh and joint line)
- Active range of motion (AROM) of knee
- LE ROM and flexibility
- LE strength
- Functional movement mechanics
    - Gait, single leg balance, squat, step up/downs

TREATMENT RECOMMENDATIONS

- Scar mobilizations
- Patellar complex mobilizations
- LE flexibility (hamstring/gastrocnemius/quadriceps)
- Knee AROM, as tolerated
- Core stabilization
- Hip PREs
- Quadriceps strengthen progression
- Bilateral closed chain strengthening
    - Do not load beyond 90 degrees knee flexion
- Functional strengthening: progress bilateral to unilateral; isometric to isotonic; concentric to eccentric
    - Squat progression: double leg → split stance→ single leg
    - Step Up: progress heights and directions (forward, lateral)

    - Step Down: progress heights (starting with 2-4”) and directions (lateral, anterior)
- Balance and proprioception training
    - Single Leg: stable to unstable surface, eyes open to eyes closed, static to dynamic, add perturbations
- Standard stationary bicycle (when knee flexion >110 degrees)
- Cardiovascular conditioning
    - Upper body ergometer, aqua jogging, elliptical (when able to perform a 6” step up with proper mechanics)

CRITERIA FOR ADVANCEMENT

- Functional strength:
    - Symmetrical squat to parallel without compensations
    - Ascend and descend an 8-inch step with good control
- Isometric knee extension strength: within 70% limb symmetry index (LSI)
- Knee AROM: Full and symmetrical
- Minimal reactive knee pain or effusion

EMPHASIZE

- Functional progressions with proper movement mechanics

KNEE MENISCUS REPAIR POST-OPERATIVE GUIDELINES

Post-Operative Phase 3: Weeks 13-20

PRECAUTIONS

- Monitor response to load to avoid reactive pain or effusion
- Avoid twisting, pivoting, and cutting

ASSESSMENT

- LEFS
- NPRS
- Girth measurement (thigh and joint line)
- LE ROM and flexibility
- LE strength/limb symmetry index: handheld dynamometry and/or isokinetic testing, if available
- Functional assessment:
    - Split squat, single leg squat, Y-balance testing

TREATMENT RECOMMENDATIONS

- LE flexibility, as needed
- Hip PREs
- Advanced total body strengthening with progressive load
- Quadriceps strengthening progression
- Loaded functional strengthening progression
    - Progressive squat program >90 degrees flexion
    - Lunges
- Balance and proprioception training advancement
- Initiate bilateral plyometric exercises
    - Focus on landing mechanics and load absorption first
    - Drop vertical jump, jump in place, box jump, broad jump
- Initiate agility drills
    - Linear drills only
- Initiate running program
    - Anti-gravity treadmill (Alter-G) walk/jog intervals when LSI >70%
    - Interval running program when limb symmetry index is >80% and quad strength normalized to bodyweight and height >1.7 Nm/kg
    - Refer to HSS Return to Run in Appendix
- Cardiovascular conditioning

CRITERIA FOR ADVANCEMENT

- Functional strength: single leg squat with good control and without compensation
- LE Strength: Limb symmetry index >85%
- Running, Agility, Plyometrics: consistent progression without pain or apprehension

EMPHASIZE

- Emphasize proper landing mechanics, load absorption, and equal weight bearing with plyometric exercises
- Monitor response to load to avoid reactive pain or effusion

KNEE MENISCUS REPAIR POST-OPERATIVE GUIDELINES

Post-Operative Phase 4 (Return to Sport): Weeks 21-Discharge

PRECAUTIONS

- Note importance of gradual return to participation with load and volume monitoring under guidance or physical therapist, surgeon, athletic trainer, and coach
- Avoid premature or too rapid return to sport

ASSESSMENT

- LEFS
- NPRS
- Girth measurement
- LE ROM and flexibility
- LE strength/limb symmetry index
    - Handheld dynamometry and/or isokinetic testing, if available
- Functional assessment
- STAR excursion testing
- Hop testing

TREATMENT RECOMMENDATIONS

- Advanced total body strengthening with progressive load and speed
- Advanced balance and proprioception training
- Plyometric program progression to single leg
    - Bilateral take-off to a single leg landing → single leg take-off to a single leg landing
    - Single leg hop progression:
        - hop to contralateral -> hop to ipsilateral
        - forward -> lateral
- Agility drill progressions
    - Include change of direction
    - Progress from anticipated movement to reactionary movement
    - Progress angle of cutting and intensity/speed of drill
    - Progress planes of motion:
        - Sagittal -> frontal -> transverse
- Sport specific drills
    - Mimic sport environment individualized to the patient
- Increase cardiovascular load to mimic desired activity

CRITERIA FOR DISCHARGE

- LE Strength:
  - Limb symmetry index >90%
    - Note: uninvolved side may be deconditioned
  - Quadriceps strength to bodyweight and height >3.0 Nm/kg
- Single Leg Hop testing >90% compared to non-involved leg
- No hesitation or pain with sport specific movements

EMPHASIZE

- Return to sport progression
  - Work with medical staff and coaches to return to team participation with controlled volume and load
    - Begin with non-contact play and progress to contact play
  - Progress minutes with team in controlled practice settings before advancing to game situations
  - Monitor game minutes upon return
- Compliance to prescribed maintenance program

ANKLE ACHILLES REPAIR EARLY WEIGHT BEARING POST-OPERATIVE GUIDELINES

Appendix 1:

Tear Type	Range of Motion	Weight Bearing
Longitudinal	0-90 for 4 weeks	Partial Weight Bearing 4 weeks
Ramp Lesion	0-90 for 4 weeks	Partial Weight Bearing 4 weeks
Hypermobile Lateral Meniscus	0-90 for 4 weeks	Partial Weight Bearing 4 weeks
Root Lesion	0-90 for 6 weeks	Non-Weight Bearing 6 weeks
Radial Tear	0-90 for 6 weeks	Non-Weight Bearing 6 weeks

*** Weight bearing and range of motion instructions may vary based on surgical team and procedure performed

Appendix 2: Phase 4 – Examples of Plyometrics Progression

Example 1

- Week 1: Onto box
- Week 2: In place and jumping rope
- Week 3: Drop jumps
- Week 4: Broad jumps
- Week 5: Side to side hops
- Week 6: Hop to opposite

Example 2

1. Bilateral plyometrics on leg press
2. Bilateral jumps onto a 6” box
3. Bilateral jumps in a cross pattern, e.g., clockwise (below right) and counterclockwise (below left)

1	**2**
4	**3**

1	**4**
2	**3**

4. Bilateral jumps on/off box 6” / 8” / 12”
5. Unilateral jumps in a cross pattern, e.g., clockwise (below right) and counterclockwise (below left)

1	2
4	3

1	4
2	3

KNEE MENISCUS REPAIR POST-OPERATIVE GUIDELINES

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