Return to Sport Meniscal Repair Protocol

General guidelines to consider with return to sport after Meniscal Repair:

- Optimum return to sport does not mean to return as fast as possible. An athlete who returns to sport without functional stability being restored, is at a higher risk of failure and poor outcomes.
- Once patient is able to perform CKC exercises, focus of rehabilitation is on core stabilization, return of single-leg strength, and reestablishing aerobic fitness and neuromuscular control.
- Intermediate and Late Post-Op Phases: strength and balance training: Exercises across a continuum
  - Low to high loads
  - Slow to fast motions
  - Stable to unstable platforms
  - Uni-planar to multi-planar motions
  - Concentrating to distracted performances
- Weak core/postural stabilizing muscle groups are magnified in the extremities. Core strengthening gives patient a strong, stable musculoskeletal platform to transfer power to the extremities during sport.
  - Once patient is confident and is maintaining stable position on flat ground, progress any exercise above, or other core exercises to a ball, or foam pad as the platform.
- Patient needs to continue to train the non-operated leg to decrease risk of diminished strength. Return to sport phase exercises on non-operated leg are begun 2 weeks prior to operated leg. This will return the non-injured leg to full strength and familiarized the patient with the program for the injured leg.
- Next stage is single-leg squat and lunges, forward, backward, and to the side- patient must be able to achieve 60° of knee flexion and maintain for 5 seconds without quivering to continue progression.
- Progress balance by changing surface, incline, and add distracting techniques such as catching a ball while performing the single-leg squats and lunges.
- Advanced Activity Phase: Jumping and Landing: 2 feet to single foot; unidirectional to multi-directional (vertical to horizontal to zigzag to jumps from a height)
- Return to Sporting Activity Phase: sport specific, on the field training maneuvers in a controlled environment, ex basketball: rebounding from squatted position.
- Return to play: Supervised practice situations to simulated game situations to full return.
Return-to-Sport Meniscal Rehabilitation Protocol

Immediately Post-Operative Phase (1-14 days): Maximum Protection

Goals of this phase:
- **Restore full passive knee extension**, and gradually ↑ knee flexion to 90°
- Diminish joint swelling and pain
- Restore patellar mobility
- Re-establish quadriceps control- active quadriceps contraction with superior patellar glide
- Safe environment to allow for early tissue healing

Treatments:
- **Patient Education:** What to expect, Goals of the phases, contraindicated movements/activities, etc.- **Continued throughout all phases of the protocol**
- **Modalities:**
  o Swelling/Edema Control: Ice, compression, elevation of the knee multiple times per day. CP with full Extension
  o Kinesio® Tape (basket weave technique), massage, or dry needling technique, can also be used to control swelling/edema
  o NMES: Can and should be used, if contraction deficit is present, during active muscle exercises
- **Gait Training:**
  o Patient wears brace locked at 0° for ambulation and sleeping only- can be unlocked for sitting and exercises.
  o Weight Bearing: **MD will specify if different**- 25-50% weight bearing as tolerated with bilateral crutches. **(Complex Tears: Toe Touch weight-bearing with bilateral crutches)**
- **Exercises:**
  o Ankle Pumps to ↓ swelling/edema
  o Ankle resistance band open chain exercises- all 4 directions
  o Patellar mobilization in all directions
  o Quadriceps isometric setting, Gluteal Sets- (1 set, 10 reps every hour)
  o Hamstring & Gastrocnemius/heel cord Stretches for re-lengthening
  o Straight Leg Raises (flexion, Hip abduction & adduction)- (3 sets, 10 reps)
  o Passive knee flexion exercises to tolerance, (0-90°), Gentle overpressure into full extension (PT or pt. actively)- **Avoid active knee flexion**
  o Seated heel slides PROM to help increase Knee Flexion- **Avoid if posterior horn repair was performed**
    o Knee Extension Active-Assisted Exercises 60°-0°- (up to 3 sets, 10 reps)
    o Seated upper body exercises & Upper Body Ergometer (UBE) can be performed
- **Criteria to progress to Early Post-Operative Phase:**
  o ≥ 50% PWB with crutches
  o 90° of passive knee flexion

Early Post-Operative Phase (~ 2-4 Weeks Post-Op)

Goals of this Phase:
- Continue to control Swelling/Edema
- Adequate Quadriceps/VMO contraction
- Knee PROM 0°- ≥125° for peripheral tears, (120° for complex tears)
- Discontinue Crutches- when safe and can demo proper gait
- Get Baseline IDKC or KOOS Subjective Form

Treatments:
- **Patient Education:** What to expect, Goals of the phases, contraindicated movements/activities, etc.
- **Modalities:** Continue all below:
  - Ice, compression, elevation, CP with full Extension
  - Kinesio® Tape (basket weave technique), massage, or dry needling
  - NMES: Can and should be used, if contraction deficit is present, during active muscle exercises
- **Gait Training:**
  - Continue to ambulate (and sleep for complex tears) with brace locked at 0° of extension
  - Discontinue crutches when safe and can demo proper gait- see below
  - Weight Bearing Guidelines: with brace locked in 0° extension
    - Week 2: 50% weight bearing, (25%-50% for complex tears)
    - Week 3: 75%-FWB, (50%-75% for complex tears)
    - Week 4: FWB as tolerated for both types of tears
- **Exercises:**
  - Gradually increase PROM:
    - Week 2: 0°- 100/105° (100° for complex tears)
    - Week 3: 0°-155/120° (110° for complex tears)
    - Week 4: 0°-125-135° (120° for complex tears)
  - Continue all exercises needed from previous phase, add core training
  - Multi-angle isometric Quad Setting (0° and 60°)- (1 set, 10 reps)
  - SLR all 4-Planes- (up to 3 sets, 10 reps)
  - Knee Extension exercise (90°-0°)- (up to 3 sets, 10 reps)
  - **For Peripheral Tears Only:**
    - CKC Mini Squats (0°- 45°)- (up to 3 sets)
    - CKC Wall Squat (to fatigue)- (up to 3 sets)
    - CKC Weight Shifts- diagonals
    - DL Toe Raises (not heel raises)- (up to 3 sets, 20 reps)
    - Stationary Bicycle once adequate ROM is achieved
  - **For Complex Tears:** CKC weight shifts only- Avoid twisting, deep squatting, and hamstring strengthening.
- **Criteria for Progression to Intermediate Post-Operative Phase:**
  - Met PROM goals set for this phase
  - FWB with proper gait

**Intermediate Post-Operative Phase (~ 5-7 Weeks Post-Operative)**

**Goals of this Phase:**
- Continue to control Swelling/Edema
- Discontinues Brace ~ week 4-6 Post-op- **MD will decide this timing**
- ROM 0°-135°
- Normalized gait
- No extension lag with SLR exercises, and re-established muscle control
- Get baseline SFMA & give corrective exercises for dysfunctional movement patterns
Treatments:
- **Patient Education:** What to expect, Goals of the phases, contraindicated movements/activities, etc.
  - Avoid twisting, hamstring curls, deep squatting and stooping
- **Modalities:** Only as needed, Dry Needling can also be used for Trigger Point and tissue tension release
- **Gait Training:**
  - Assist with achieving proper gait with, and once out of, the brace.
- **Exercises:**
  - Continue all exercises from previous phase, progressing with ankle weights, reps, sets, etc.
  - Leg press 70°-0° (up to 3 sets, 10-15 reps) *(Peripheral Tears)*
  - 4-way Hip exercises with hip machine
  - Active Knee Extension 90°-40° (up to 3 sets, 10 reps)
  - Wall Squats 0°-70° (to fatigue), vertical squats 0°-60° (up to 3 sets)
  - Dynamic Stretches: Pre-activity/Injury Prevention *(See Sheets)*
  - Lateral Step Ups, Front Step Downs *(Peripheral Tears only)*
  - **Initiate CKC exercises for Complex Tears:**
    - ½ squats (0°-45°)
    - Leg press (0°-60°)
    - Wall Squats (0°-60°)
    - Standing Toe Raises (up to 3 sets, 20 reps)
  - DL Heel Raises- (3 sets, 10-15 reps) *(Peripheral Tears only)*
  - Balance and Proprioceptive Training
    - Wobble/Tilt Board- balance, squats (0°-60°)
    - Cone Stepping
    - SLS Light Exercises
  - Stationary Bicycle (once ROM Permits)
- **Criteria to progress to Late Post-Operative Phase:**
  - ROM ≥135°/ Full ROM
  - Full weight bearing and able to tolerate the CKC exercises allowed in intermediate phase without pain
  - Normal gait pattern with ambulation

**Late Post-Operative Phase (~8-12 Weeks Post- Operative)**

**Goals:**
- Improve strength and endurance
- Maintain knee & total body flexibility & motion
- Increase core and balance exercises to prepare for more advanced activity
- Re-test with SFMA and continue corrective exercises
- Get Baseline KOS-Sport Score Subjective Form

**Treatments:**
- **Patient Education:** What to expect, Goals of the phases, contraindicated movements/activities, etc.
- **Modalities:**
  - Continue any modalities appropriately
- **Exercises:**
  - Continue all previous phase exercises that are appropriate progressing as athlete tolerates
  - Progress Flexibility and Strengthening exercises
  - Continue Dynamic Stretches
  - Progress Core and add Scapular Stabilization exercises
  - Initiate Front Lunges *(Peripheral Tears Only)*
  - Initiate light hamstring curls *(Peripheral), (10-12 weeks for Complex)*
  - Progress Balance/Proprioceptive training
  - DL Heel Raises *(Complex Tears), SL Heel Raises *(Peripheral Tears)*

**Functional Assessments:**
- Retest SFMA end of treatment to assess progression of corrective exercises
- **Core Testing: See Testing Sheets**
  - Segmental Multifidus Test
  - Trunk Curl Up Test
  - Double-Leg Lowering Test
  - Side Bridge Test
  - Prone Bridge Test
  - Supine Single-Leg Bridge Test
  - Extensor Endurance Test
- **Criteria for Progression to Controlled Activity Phase:**
  - No/Minimal Pain & Swelling/Edema
  - Full ROM
  - No pain with any of the current exercises

**Controlled Activity Phase**

(*13-16 Weeks for Peripheral Tears) (*13-24 Weeks for Complex Tears*)

**Goals:**
- Maintain Knee and Total Body Flexibility and ROM
- Get a Baseline FMS and Y-Balance Test ~ 14-16 weeks post-op- *(Peripheral), ~16-18 weeks *(complex)*
- Restore as close to symmetrical hip and LE strength with non-op LE as possible
- KOS-sports score of >70%

**Treatments:**
- **Patient Education:** What to expect, Goals of the phases, contraindicated movements/activities, etc.
- **Exercises:**
  - **Dynamic Stretches:** Begin Sports and Advanced Performance Dynamic Stretches *(See Sheets)*
  - **Peripheral Tears:**
    - Continue to progress all stretching, strengthening, balance, Core/Scapular Stabilization exercises
  - **Complex Tears:**
    - Continue all previous phase exercises and progress as appropriate
    - Initiate Front lunges
    - Initiate a walking program (gradually increasing distance .2-.5 mile per week)
Functional Assessments:
- FMS® and Y-Balance Assessment™ at mid-end of this phase
- Core Testing: at end of phase- (See Test Sheets)
  o Segmental Multifidus Test
  o Trunk Curl Up Test
  o Double-Leg Lowering Test
  o Side Bridge Test
  o Prone Bridge Test
  o Supine Single-Leg Bridge Test
  o Extensor Endurance Test
- Criteria to Progress to Advanced Activity Phase:
  o Demo good performance, posture and balance with all current exercises; with no pain or swelling
  o Full ROM
  o Able to walk ≥ 2 miles without d symptoms
  o Clearance from MD to begin Squatting, Cutting, and Running

Advanced Activity Phase
(~16-24 Weeks Peripheral Tears, ~24- 36 Weeks Complex Tears)
Goals for this phase:
- Normalize lower extremity strength, and increase muscle power and endurance
- Maintain/Gain Hamstring & Quadriceps Strength and Girth of 80% or greater
- Continue to improve neuromuscular control
- Initiate and Complete Walk-to-Run Protocol
- Initiate and Complete Plyometric Protocol
- Prepare and Assess athlete for Return to Specific Sporting Activity Phase- (See Functional Testing List on next page)
- KOS-sports score of >70%
- Patient is tested with the Landing Error Scoring System (LESS): (See Sheets) - Test at Patient’s individual max vertical jump height, not standard measure on the LESS- Test placement may be too high/too low for accurate individual jump assessment score, no sooner than 10-12 weeks post-op
  o Excellent Score is <4
  o Good Score is >4 and <5
  o Moderate Score is >5 and <6
  o Poor Score is >6
- FMS® (goal of ≥14/21 points with no 0/3, 1/3, or asymmetries) and Y-Balance Test™ score (goal statistically symmetrical to non-injured leg)
- Perform hop testing no sooner than 20 weeks (Peripheral), and 30 (Complex) weeks post-op: (See Sheets)
  o 2 practice trials, 2 timed/measured trials; average injured to non-injured
  o 1- Single-leg hop for distance
  o 2- Triple hop for distance
  o 3- Single-Leg Crossover triple hop
  o 4- 6-Metered timed hop
  o DL Jump Test
  o Tuck Jump Test

(860) 549-8210 • oahct.com
Treatments:
- **Patient Education:** What to expect, goals of the phases, contraindicated movements/activities, etc.
- **Exercises:**
  - Continue to progress all Strengthening, Stretching, Stabilization, Balance/Proprioception, and Endurance exercises
  - Begin **Sport Specific Dynamic Stretches** for sport athletes participates- (See Sheets)
  - **Deep Squatting** is permitted at 16 weeks- **(Peripheral Tears)**, 24 weeks- **(Complex Tears)**
  - **Walk-to-Run Protocol** and straight Agility Ladder Drills at 16 weeks- **(Peripheral Tears)**, 24 weeks- **(Complex Tears)**
  - **LE Plyometric Protocol** is permitted at 20 weeks- **(Peripheral Tears)**, and 30 weeks- **(Complex Tears)**
  - **Begin Interval Running Protocol:** 20-22 weeks **(Peripheral Tears)**, 28-30 weeks **(Complex Tears)**
  - **Begin Interval Sport-Specific Protocol:** (ex. Return to Kicking, Swinging, etc.)
  - **Agility Drills**
    - Begin Pivoting, Caricuras, Zigzags, Side-Shuffling, Sudden Start and Stops, Figure-8’s, 45° and 90° Cutting drills, box jumps (progressing & varying heights up to 20cm), & Lateral and Rotational Agility Ladder Drills at 20 weeks- **(Peripheral Tears)**, 28 weeks- **(Complex Tears)**

- **Criteria for progression to Sport-Specific Training:**
  - No Pain or Swelling with any activities currently performing
  - Full ROM and Strength ≥ 90% of the non-injured LE
  - A score of ≥14/21 on the FMS® Assessment Screen, with No 0/3= pain on any of the 7 fundamental movement patterns
  - No statistical asymmetries and on the Y-Balance Test™ with composite score ≥ 95/100
  - Hop Tests (90% or higher compared to non-injured leg)
  - Limb Symmetry Index (LSI) of 90% or greater on hop tests
  - IKDC Score ≥ 85%, or the KOOS score of ≥85
  - KOS-Sports Score 90% or greater
  - Isokinetic testing: (if available), or Dynamometry
    - Quadriceps (90% or greater) compared to non-injured leg
    - Hamstring (85%-100%) compared to non-injured leg
    - Hamstring-Quadriceps Ratio (80% or greater)

**Functional Testing:** for progression to sport-specific training- (No sooner than 24 Weeks- Peripheral Tears, and 36 Weeks- Complex Tears) -*Can be perform over multiple days- See Attached Sheets

**Strength and Power Testing:**
- Single-Leg Squat test/ Single-Leg Squat test
- Vertical Jump test
- Figure-8 Hop test
- Up-Down test
- Hexagon test (DL), Modified Hexagon Hop test (SL)

**Speed, Agility, and Quickness Testing:**
- T-Test, or Modified Agility T-Test (MAT)
- Three-Cone Drill Test
- Slalom Test
- Backward Movement Agility Test
- Zigzag Run Test
- Lower Extremity Functional Test (LEFT)

**Core Testing:**
- Segmental Multifidus Test
- Trunk Curl Up Test
- Double-Leg Lowering Test
- Side Bridge Test
- Prone Bridge Test
- Supine Single-Leg Bridge Test
- Extensor Endurance Test

**Function and Balance Testing:**
- FMS® Assessment Screen
- Y-Balance Test™
- Vail Sports Test™

**Sport Specific Training Phase**

**Goals of this Phase:**
- Return to sport participation- **Final Decision from MD**

**Treatments:**
- Continue Sport Specific Dynamic Stretches, and Interval Running, and Interval Sport-Specific Sport protocols
- Supervised sport specific training by clinician, athletic trainer, and/or coaches
References

- Goulbourne, Shaun. Sports-Related Injuries in the Young Athlete (book from training course). 2011; Cross Country Education, LLC.