Meniscus Repair

1. Defined
    a. Sutures or bioabsorbable fixation devices (arrows, darts, screws, etc.) bring together and fixate the edges of a tear in the meniscus in order to maintain the shock absorption capacity of cartilage in weight bearing.
2. Goals
    a. Control post-operative pain and swelling
    b. Restore motion
    c. Restore functional strength, stability, and neuromuscular control
    d. Protect the fixation and healing tissue from undue stress
3. Rehabilitation Principles (specific to meniscus repair)
    a. When in combination with ACL reconstruction follow ACL guidelines.
    b. The healing environment with isolated meniscus repair is inferior to that with concomitant ACL reconstruction.
    c. As knee flexion increases, compressive loads across the meniscus increase.
    d. The combination of weight-bearing and knee flexion causes a combination of compression and shear across the meniscus that may be detrimental to the repair.
    e. Location of the tear and the type of fixation are key determinants of progression of rehab after meniscus repair. (too vigorous rehab can lead to failure).
    f. Limit muscular inhibition and atrophy from effusion.
    g. Initiate early activity of quads and hamstrings (isometric, isotonic, resistive), (e-stim and biofeedback).
    h. Incorporate comprehensive, lower extremity (hip and calf) muscle stabilization and strengthening activities, as well as core strengthening activities.
    i. Address limb confidence issues with progression of unilateral activity.
    j. Address limb velocity issues during gait with verbal and tactile cueing.
    k. Identify motion complications early and begin low-load, long-duration stretching activity:
        i. ROM expectations
        ii. Visit 2 - 0-60
        iii. Week 2 - 90 degrees flexion, full knee extension
        iv. Week 4 - AROM within 10 degrees of involved
        v. Week 6 - full knee flexion (heel to buttock)

l. Initiate early proprioceptive activity and progress by means of distraction techniques:
    i. eyes open to eyes closed
    ii. stable to unstable
m. Bilateral to unilateral
n. Constantly monitor for signs and symptoms of patellofemoral irritation.
o. Encourage low impact cardiovascular activity and patellofemoral protection strategies. (especially those found to have CMP at surgery

4. Clinical Restrictions
    a. No weight bearing for 4 weeks
    b. No flexion under weight-bearing beyond 45 degrees for 8 weeks.
    c. No flexion under weight-bearing beyond 90 degrees for 12 weeks.
5. Assistive Device Guidelines
    a. **Post-op brace:**
        i. Locked at 0 degrees for first 4 weeks.
        ii. DC brace at end of week 4 (typically coincides with follow up M.D. appointment.
        iii. In first 4 weeks patient can be out of brace at night if full extension is achieved.
    b. **Crutch use:**
        i. 2 crutches 4 weeks NWB then progress to 1 crutch to normalize gait
        ii. Progression dependent upon:
        iii. Adequate quad control
        iv. No observed gait deviations
        v. No change in pain, swelling or effusion.
6. Functional Activity Guidelines
    a. Driving:
        i. 7-14 days
        ii. Dependent upon:
        iii. Adequate muscle control for braking and acceleration.
        iv. Proprioceptive/reflex control.
        v. Adequate ROM to get into driver's side.
        vi. Confidence level
        vii. Car insurance restrictions on driving after surgery
        viii. No requirement of pain medication
    b. **Golf**
        i. 12-16 weeks
        ii. Dependent upon:
        iii. Symptoms (swelling and pain)
        iv. Range of motion
        v. Quad control
        vi. Proprioceptive/reflex control of limb
        vii. No limb-velocity asymmetry with gait
        viii. Encourage the following
            1. Backwards golf

2. Putting, chipping, short irons, 50% swing, 75% swing, 100% swing
3. Avoid bunkers, uneven surfaces and severe slopes
4. Warm up properly with stretching

c. Jogging on treadmill
   i. 2-3 months (8-12 weeks)
   ii. Observe and minimize limb velocity asymmetry
   iii. Encourage lower impact activity
d. Cutting and Rotational activity
   i. 12-16 weeks
e. Return to sport
   i. 12-16 weeks (3-4 months)
   ii. Dependent upon:
      1. Full ROM
      2. Good quad control
      3. 80% score on hop testing
      4. 80% isokinetic score (when ordered and appropriate)

7. Modalities
   a. **Electrical Stimulation (VMS, biphasic or Russian):**
      i. Intensity to observed contraction
      ii. Appropriate until symmetrical intensity contraction
      iii. Proximal, lateral quad and distal, medial quad pad placement
      iv. Variety of positions: quad set, SLR, multi-angle isometrics, mini squats, step-ups.
      v. Premodulated, high-volt., bi-phasic, with ice for pain and swelling as needed.
8. Rehabilitation
   a. Week 1-2 Clinical Guidelines:
      i. Control post-op swelling and effusion
      ii. Maintain patellar mobility
      iii. Restore active and passive ROM in open-chain
      iv. Inhibit post-op muscle shut down and quad atrophy (e-stim, biofeedback, verbal/tactile cueing)
      v. Progress comprehensive lower extremity stretching program in open-chain positions
      vi. Progress hip, calf and core strengthening activities in open-chain positions.
      vii. Cue for proper gait with assistive device appropriately
   b. Week 1-2 Clinical Expectations
      i. Full knee extension
      ii. AROM knee flexion to 90 degrees
      iii. Fair+ to Good – quad contraction
      iv. SLR without quad lag
      v. Mod to min effusion
      vi. Ambulating in brace NWB with 2 crutches
   c. Week 2-4 Clinical Guidelines

i. Control post-op swelling and effusion
ii. Maintain patellar mobility
iii. Restore active and passive ROM in open-chain
iv. Inhibit post-op muscle shut down and quad atrophy (e-stim, biofeedback, verbal/tactile cueing)
v. Progress comprehensive lower extremity stretching program in open-chain positions
vi. Progress hip, calf and core strengthening activities in open-chain positions.
vii. Cue for proper gait with assistive device appropriately

d. Week 2-4 Clinical Expectations
i. Full knee extension
ii. AROM to within 10 degrees of uninvolved
iii. Minimal effusion
iv. Good – quad control
v. Full patellar mobility
vi. Ambulation with 2 crutches NWB

e. Weeks 5-7 Clinical Guidelines
i. Control post-op swelling and effusion
ii. Restore ROM
iii. Inhibit post-op muscle shut down and quad atrophy (e-stim, biofeedback, verbal/tactile cueing)
iv. Progress comprehensive lower extremity stretching program
v. Progress bilateral and unilateral, closed-chain activity to improve limb confidence with knee flexion less than 45 degrees
vi. Progress bilateral and unilateral, proprioceptive activity and reactive neuromuscular training (RNT)
vii. Progress hip, calf and core strengthening activities
viii. Cue for proper gait with and without assistive device appropriately.
ix. Progress unilateral flexion under weight-bearing activity (ie. step ups) with knee flexion less than 45 degrees.
x. Progress no-impact endurance activity.
xi.

f. Weeks 5-7 Clinical Expectations
i. Symmetrical extension, full knee flexion with asymmetry to end feel
ii. Visible and strong quad contraction (Good- to Good)
iii. Ambulating without deviations
iv. Minimal to no effusion
v. Able to stand on involved extremity for 30’
vi. Able to perform unilateral squat to 45 degrees symmetrically

g. Weeks 8 Clinical guidelines
i. Continue activities from weeks 1-8
ii. Initiate bilateral, low-amplitude plyometric activities with emphasis on deliberate, quality movement.

h. Week 8 Clinical Expectations
    i. Symmetrical extension, full, pain-free knee flexion (heel to buttock)
    ii. Visible, strong, but asymmetrical quad contraction (Good – to Good)
    iii. Ambulating without deviation and without limb velocity asymmetry.
    iv. Able to land but with asymmetry to landing pattern during bilateral, low-amplitude plyometrics.
i. Week 9 Clinical Guidelines
    i. Continue activities from weeks 1-9
    ii. Continue bilateral, low-amplitude plyometric activities with emphasis on deliberate, quality, movement.
    iii. Initiate unilateral, low-amplitude plyometric activities
    iv. Initiate and progress bilateral, moderate-amplitude plyometric activity (includes jogging)
        1. – (moderate amplitude = 0-6 inches high and 25-50% max distance.)
j. Week 9 Clinical expectations
    i. Symmetrical extension, full, pain-free knee flexion (heel to buttock)
    ii. Visible, strong, but asymmetrical quad contraction (Good – to Good)
    iii. Ambulating without deviation and without limb velocity asymmetry.
    iv. Able to land but with asymmetry to landing pattern during bilateral, low-amplitude and bilateral, moderate-amplitude plyometrics.
k. Week 10 Clinical guidelines
    i. Continue activities from weeks 1-10
    ii. Continue bilateral, low-amplitude plyometric activities with emphasis on deliberate, quality movement.
    iii. Continue unilateral, low amplitude plyometrics
    iv. Progress bilateral, moderate-amplitude plyometric activity (includes jogging)
    v. Initiate unilateral, moderate-amplitude hopping activity
        1. – (moderate amplitude = 0-6 inches high and 25-50% of max distance.)
l. Week 10 Clinical Expectations
    i. Symmetrical extension, full, pain-free knee flexion (heel to buttock)
    ii. Visible, strong, but asymmetrical quad contraction (Good – to Good)
    iii. Ambulating without deviation and without limb velocity asymmetry.

iv. Able to land but with asymmetry to landing pattern during unilateral, moderate-amplitude hopping

m. Week 11 Clinical Guidelines
   i. Continue activities from weeks 1-10
   ii. Continue bilateral and unilateral, low-amplitude hopping
   iii. Progress unilateral and bilateral, moderate-amplitude hopping (includes jogging)
   iv. Initiate bilateral, high amplitude hopping
      1. –(high amplitude = 6-12 inches high, 50-75% max distance)
   v. Progress higher level agility activities (forward, retro and lateral only – no cutting activities). Ladders, cones, lateral shuffling etc.

n. Week 11 Clinical Expectations
   i. Symmetrical extension, full, pain-free knee flexion (heel to buttock)
   ii. Visible, strong, but asymmetrical quad contraction (Good – to Good)
   iii. Ambulating without deviation and without limb velocity asymmetry.
   iv. Able to land but with asymmetry to landing pattern during unilateral, moderate-amplitude hopping and bilateral, high amplitude hopping.

o. Weeks 12-16 Clinical Guidelines
   i. Continue activity from weeks 1-12
   ii. Continue bilateral and unilateral, low-amplitude hopping
   iii. Continue bilateral and unilateral, moderate amplitude hopping
   iv. Continue bilateral, high-amplitude hopping
   v. Initiate unilateral, high amplitude hopping
   vi. – (high amplitude = 6-12 inches high, 50-75% max distance)
   vii. Progress higher level agility activities
   viii. Initiate sports-specific cutting and agility activity.

p. Weeks 12-16 Clinical expectations
   i. Symmetrical extension, full knee flexion (heel to buttock)
   ii. Visible, strong, symmetrical quad contraction (Good)
   iii. Ambulating without deviation and without limb velocity asymmetry
   iv. No effusion
   v. Able to demonstrate good landing with all hopping activity
      1. Good athletic posture (spine erect and shoulders back)
      2. No valgus with landing
      3. Soft landing
      4. Able to “stick the landing”
   vi. Demonstrate 80-100% score on single leg hop test.
   vii. Proper coordination with sport-specific, agility activity.