ValleyOrtho Rehabilitation Playbook Series

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Surgical Procedure: Meniscectomy

The intent of this information is to inform the treating clinician on the evidence-based considerations to be used as a guideline regarding the surgery noted above. This is not a substitute for appropriate clinical decision making, but a supplement to that effect. If at any time a clinician feels uncertain about a given phase discrepancy or patient presentation they are strongly encouraged to discuss this with the referring physician and his/her team.
****It is the responsibility of the therapist to read the operative report before providing care to the patient to improve treatment communication***.*

Therapeutic Activity Progression Disclaimer: Progression to the next phase should be strongly based on meeting clinical criteria (not solely based on the post-operative timeframes) as appropriate and in collaboration with the referring surgeon. Exercise prescription should be clinically directed by pain and performance absent of detrimental movement patterns with respect to proper biomechanics of the spine, hip, knee and ankle.

Communication Recommendations from Therapist to Surgical Team: When a treating therapist feels the need to reach out to Dr. Liotta, or a member of his team, at any point for any reason they are strongly encouraged to do so. All concerns are not explicitly written and clinical judgement is paramount. Below is a handful of reasons and suggested methods of contact to promote communication:

Urgent Red Flag Communication
- Uncontrollable and unremitting pain.
- Signs of infection at incision or treated limb.
- Severe palpation tenderness, swelling, tachycardia (UE or LE DVT).
- Labored breathing (PE).
- Drastic decline in ROM.
- After a fall/trauma, or near fall/trauma, resulting in a clinical change.

Preferred Contact Method: 1. Immediate call to MD or PA Cell. 2. Office phone call to request consult with MD/PA/MA/ATC until answer.

Administrative Needs
- Rehabilitation Prescription needed or specific Rx change requests.
- Appointment needed with the physician office, or medication refill.

Preferred Contact Method: Office phone call to MA/ATC.

Other Patient Concerns During Clinic Hours M-TH 9am-5pm F 9-3pm
- Abnormal pain, comorbidities or complications that may prevent attainment of established discharge criteria.
- Patient is noncompliant with rehabilitation process.
- Excessive muscle guarding/motion phobia after 1-2 outpatient visits.
- Adverse work or home practices negatively impacting recovery.
- Patient expresses discontent or concerns with the current POC established by PT and/or by MD/PA

Preferred Contact Method: Phone call to MD &/or PA

Preferred Updates before checkup visits with MD/PA
During Clinic Hours M-TH 9am-5pm F 9-3pm
- Information regarding adherence/participation in rehabilitation process.
- Comments on progress and trend of the patient's rehab course.

Preferred Contact Method: Phone call MD and/or PA. Or Fax update.

Phase 1: Edema, Quadriceps & ROM Recovery (*wks 0 -2*)

Goals:

- Initiate therapy around post-op day 4[10]
- Minimize pain/swelling to decrease quad inhibition[2, 9]
- Normalize quadriceps activation/control[2, 9]
- Set baseline KOOS-pain/KOOS-Sport for RTS readiness[1] (Appendix A)

Precautions/Restrictions:

- WB/Gait:
  - ☐ WBAT[2, 9, 12], initial ambulation with bilateral crutches[2, 9]
  - ☐ Wean patient from crutches ≠ limp and pain as able[2, 9]
- A/AA/PROM:
  - ☐ Week 0-1 ROM 0-90°[2, 9] Then ROM progression as tolerated for full ROM by wks 4-6[9]
  - ☐ Emphasis should be towards terminal knee extension initially[2, 9]
- Activity:
  - ☐ No impact training until week 4+[9, 11]

Phase 1 Therapeutic Activities:

- Gait:
  - ☐ Progression from bilateral crutches to single crutch to no AD as able
- ROM:
  - ☐ Manual & self-management for flexibility, swelling and full ext[2, 9]
  - ☐ Scar and patellar mobilizations on healed incisions[9]
  - ☐ Bike partial or full revolutions for ROM gains/maintenance [2, 9]
- Strengthening:
  - ☐ Total lower extremity OKC and CKC strengthening/activities aimed avoid valgus collapse and promote core strength/pelvis control through full knee ROM as tolerated[2, 9]
  - Quad TKE focused activity[2, 9]
  - ☐ NMES to quad with volitional contraction as needed [2, 9]
  - ☐ Slow and progressive NWB total LE strengthening[2]
  - ☐ Mini Squats TKE to mid-range to tolerance[2, 9]
- Balance:
  - ☐Proprioception with TKE control[2, 9, 13]

Minimum Criteria for Progression to Phase 2:

- AROM 0^0-90^0[2]
- 20 SLR ≠ Quad Lag [2, 14]

Phase 2: ROM & Total LE Strengthening (*wks 3 - 4*)

Goals:

- Rehabilitation may progress aggressively because there is no anatomic structure that requires protection[2, 3, 10] while concurrently controlling for effusion, pain and inflammation[3]
- Restore near full ROM[2, 9]
- Normalize gait without AD[2]
- Improve muscle strength and endurance[2]
- Improve balance and proprioception[2, 9, 13]

Precautions:

- Activity:
  - ☐ Avoid impact training until weeks 4+[9, 12]
  - ☐ Once single leg press is ≥ 75% LSI begin submax impact training with progressions as tolerated to full intensity impact activities[9]

Phase 2 Therapeutic Activities:

- Gait:
  - ☐ Ensure proper weight shifting over involved extremity
- ROM:
  - ☐ Manual & self-management for flexibility, swelling for return to full ROM[9]
- Strengthening:
  - ☐ Total lower extremity OKC and CKC strengthening/activities aimed avoid valgus collapse and promote core strength/pelvis control through full knee ROM as tolerated[2, 9]
  - ☐ High-load progressive quad strengthening may be indicated to target an increase in muscle activation specifically in concentric actions at 70-80% 1 repetition max[7, 10]
  - ☐ Recovery of hamstring muscle function and quadriceps control at low force production levels during stability training is not as indicated as concentric quad strength recovery[7]
- Balance:
  - ☐Proprioception training progressions[2, 9, 13]

Criteria for Progression to Phase 3:

- Normal gait mechanics without AD
- 0-125° AROM

Phase 3: Total LE Strengthening & Return to Activity (*wks 5+*)

Goals:

- Address remaining barriers to RTS via KOOS-pain/KOOS-sport[1]
- Optimize biomechanics at the hip, knee and ankle
- Increasing strength to support desired activity
- **In prepubescent patients:** focus primarily on form control and movement patterns instead of muscle hypertrophy as their bodies will not put on muscle growth as in more mature patients[15]
- Establish patient specific HEP relative to resources and goals.

Precautions:

Phase 3 Therapeutic Activities:

- ROM:
  - ☐ Manual & self-management for gains in ROM, flexibility & swelling
- Strengthening & Activity; As Tolerated:
  - ☐ Running Progressions with proper swelling and pain control[11]
  - ☐ Slow progressions of cutting/pivot & decelerating intensity[9]
  - ☐ Continue total lower extremity strengthening based on deficits
  - ☐ Neuromuscular training for proper landing mechanics is important as patient's alter jump landing mechanics to decrease quad use (forward anterior trunk lean with or without increased knee flexion) in involved knee up to 3 months after surgery despite = Quad LSI muscle testing[6]
- Balance:
  - ☐ Proprioception training progressions with variable surfaces and perturbations

Criteria for Return to Light Recreational Activity:

1. Full AROM and joint girth at 100% LSI[16, 17]
2. WB symmetry with squat form to 60^{0} [16, 17]
3. Stork test at 90% LSI[16, 17] (Appendix B)
4. Isometric leg press at 60^{0} of knee flexion LSI ≥ 75%[16, 17] (Appendix C)
5. Isometric quad and HS LSI ≥ 75% at 60^{0} of flexion[16, 17] (Appendix D-E)
6. Anterior Reach ≤ 4cm difference Vs uninvolved LE[16, 17] (Appendix F)
7. Single leg hop test LSI ≥ 70%[17] (Appendix G)

Criteria for Progression to Return to Activity Testing:

- Reports confidence with all running and jumping tasks
- Full return to activity should be based on achieving clinical criteria
- If comorbidities create unattainable goals for discharge, discuss this with the treating physician group.

Criteria for Full Return to Recreational/Sport Activity:

General Ortho Patient:

- Patient meets all return to light activity criteria in phase 3.
- Max single leg press LSI ≥ 90%[9, 10]

Recreational Athlete Sequence (includes above):

- Max Isometric Quad and HS LSI ≥ 90% [10] OKC at 60^{0} of knee flexion.
- Single leg hop test and Crossover hop test[21] for distance: LSI ≥ 90%[10]

Competitive Athlete (includes above):

- Max single leg press LSI ≥ 95%[10]
- Max Isometric Quad and HS LSI ≥ 95%[10] OKC at 60^{0} of knee flexion
- Single Leg hop test for distance: LSI ≥ 95%[10]
- Side Hop test: LSI ≥ 90%[10] (Appendix G)
- Crossover hop test for distance ≥ 95% LSI[10, 18] (Appendix I)

Other Literature Review Notes:

- Delayed / decreased outcomes with lateral vs medial partial meniscectomy[1, 3] potentially due to:
  - ☐ Lateral meniscus supports approximately 70% of the load transmission at Tibiofemoral joint[1]
  - ☐ Lateral meniscus undergoes 2x anteroposterior translation that the medial meniscus does during knee flexion[3, 11]
  - ☐Higher prevalence of effusion with lateral vs medial meniscectomy with RTS activity[11]
- Female gender and increased OA before surgery are associated with a slower rate of recovery from arthroscopic partial mniscectomy[5]
- Quad weakness often persists at 6 months and is attributed to neural impairment (activation failure) in maximum concentric and isometric actions. Maximum quad eccentric action did not differ from uninvolved[7]
- Self-reported timeline for return to sport at PLOF:
  - ☐ RTS < 30yo 7.7 wks[12]
  - ☐ RTS > 30yo 12.7 wks[12]

Abbreviation List:

AAROM: Active assisted range of motion
ABD: Abduction
AD: Assistive device
ADL: Activity of daily Living
AROM: Active range of motion
BPTB: Bone patellar tendon bone
BW: Body Weight
CKC: Closed kinetic chain
DVT: Deep vein thrombosis
ER: External rotation
EXT: Extension
FWB: Full weight bearing
GHJ: Gleno-humeral joint
HEP: Home exercise program
HS: Hamstring
IR: Internal rotation
LCL: Lateral collateral ligament
LE: Lower extremity
MA: Medical assistant
LSI: Limb Symmetry Index = *(Average score of the involved leg divided by the score of the uninvolved leg for a specific test)*
MCL: Medial collateral ligament
MD: Medical doctor
NWB: Non weight bearing
OKC: Open kinetic chain
PA: Physician assistant
PCL: Posterior cruciate ligament
PE: Pulmonary embolism
PLC: Posterior lateral corner
PROM: Passive range of motion
ROM: Range of motion
RP: Resting position
RROM: Resisted range of motion
RTS: Return to sport
SLR: Straight leg raise
UE: Upper extremity
TKE: Terminal knee extension
WB: Weight bearing
WBAT: Weight bearing as tolerated
#: Pounds
≠: Absent/Without
≈: Approximately
≤: Less than or equal to
≥: Greater than or equal to

Return to Activity Test Descriptions:

Stork Balance Test[19]: (Appendix B for diagram)

- Hands on hips. NWB foot: medial distal femur or medial proximal tibia.
- Timer starts when the patient lifts heel of the stance foot off the ground.
- Timer stops if/when the patient removes hands from hips, NWB foot from medial stance leg or the heel comes in contact with the ground.

Anterior Reach Test[16, 17]: (Appendix F for diagram)

- Stand on one leg and slide a tissue box forward with the toes of the other foot by pushing on the side of the box. Goals is to push the box as far as possible and return back to the starting upright position.
- Once contact is lost between the toes and the box the slide is over.
- Perform 6 warm up attempts per leg to diminish learning effect.
- Failed attempt = the sliding foot touches down on the floor or on top of the slide box before returning back to the starting position. Cannot kick or flick box forwards.
- Distance is measured from toe of standing foot to back edge of the box. Take the best of 3 attempts for each leg.

Single Leg Hop Test for Distance[20]: (See Appendix D for diagram)

- Measure patient's standing height in cm for pass/fail.
- Hands clasped behind the back to prevent arm swing momentum.
  - □ Arms can release for landing assistance after leaving ground.
- 4 progressive warm up jumps ≈ 25%, 50%, 75% and 100% intensity.
- Patient must "stick" the landing ≠ significant knee valgus.
- Use the best of 3 maximum effort jump tests.
- Distance is measured from toe of start line to shortest distanced heel.

Single Leg Timed Side Hop Test[21]: (See Appendix E for diagram)

- Set up: 2 parallel lines on floor, with outer edges of lines 40cm apart.
- Start position: standing on single test leg with hands behind the back.
- Action: Patient hops from outside of one line to outside of the other.
- Record the total number of completed foot strikes in 30 seconds.
  - □ Completed foot strikes = foot lands completely outside the line, without touching the line, while maintaining hand position.

Crossover Hop Test[18]: (See Appendix F for diagram)

- Patient starts on one leg with center line just lateral to stance leg.
- Patient is instructed to maximally hop forwards 3 times on the same. stance leg, alternately crossing a ≈15cm wide line.
- Distance is measured from toe of start line to heel of 3rd landed hop.

Quick Reference Activity Timeline:

Activity	Activity Progression Restrictions
Weight Bearing / Gait	• Immediately WBAT, wean from crutches without limp as able
Knee ROM	• 0-90° Day 0-7 then progress flexion as tolerated
CKC Squats	• As tolerated controlling for effusion, pain and inflammation
OKC RROM	• As tolerated controlling for effusion, pain and inflammation
Plyometrics	• ≈ Week 5 With leg press LSI ≥ 75%, OK to begin double leg to single leg with good valgus control • Monitor process to avoid increased swelling/pain
Running	• Minimum requirement to see leg press LSI ≥ 75% • It is preferable to meet all of the return to light recreational activity criteria on page 3 before running
Return to Sport Cleared by MD	• Having met the return to activity testing criteria related to level of desired activity intensity on page 3 • Typical return to activity timelines vary ≈ 6-16 weeks[1, 9, 11, 12]

Appendix A:
KOOS-pain/KOOS-sport

KOOS-Pain & KOOS-Sport Knee Surveys

Scoring KOOS Tests:
Items are scored on a 0-4 scale. Compare scores from the time of surgery to the time of return to activity to determine if Minimal Clinically Important Difference (MCID) that shows significant positive trend of RTS has been met.

Scoring KOOS-Pain:
The MCID is 9.7 points improvement for KOOS-pain[1]

Scoring KOOS-Sport:
The MCID is 14.7 points improvement for KOOS-sport[1]

Today's date: _____/_____/_____ **Date of birth:** _____/_____/_____

Name: _____

INSTRUCTIONS: This survey asks for your view about your knee. Answer every question by ticking the appropriate box, only one box for each question. If you are unsure about how to answer a question, please give the best answer you can.

PAIN:

	Never	Monthly	Weekly	Daily	Always
1. How often do you experience pain?	☐	☐	☐	☐	☐
What amount of knee pain have you experienced the last week during the following activities?					
	None	**Mild**	**Moderate**	**Severe**	**Extreme**
2. Twisting/pivoting on your knee.	☐	☐	☐	☐	☐
3. Straightening knee fully.	☐	☐	☐	☐	☐
4. Bending knee fully.	☐	☐	☐	☐	☐
5. Walking on flat surface.	☐	☐	☐	☐	☐
6. Going up or down stairs.	☐	☐	☐	☐	☐
7. At night while in bed.	☐	☐	☐	☐	☐
8. Sitting or lying.	☐	☐	☐	☐	☐
9. Standing upright.	☐	☐	☐	☐	☐
	Total Score 1-9:				

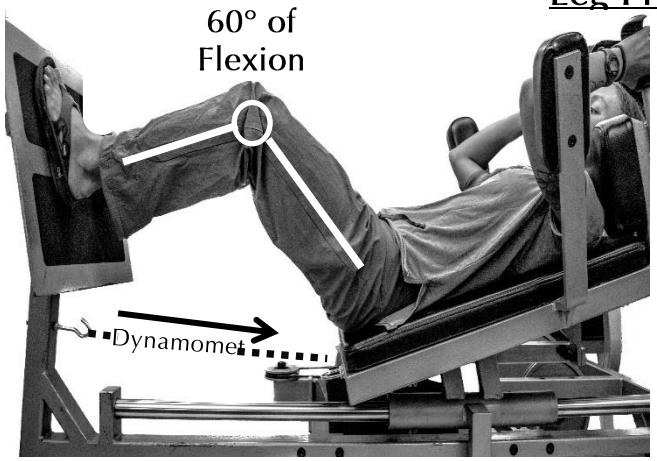
SPORT:

The following questions concern your physical function when being active on a higher level. The questions should be answered thinking of what degree of difficulty you have experienced during the **last week** due to your knee.

	None	Mild	Moderate	Severe	Extreme
1. Squatting.	☐	☐	☐	☐	☐
2. Running.	☐	☐	☐	☐	☐
3. Jumping.	☐	☐	☐	☐	☐
4. Twisting/Pivoting on your knee.	☐	☐	☐	☐	☐
5. Kneeling.	☐	☐	☐	☐	☐
	Total Score 1-5:				

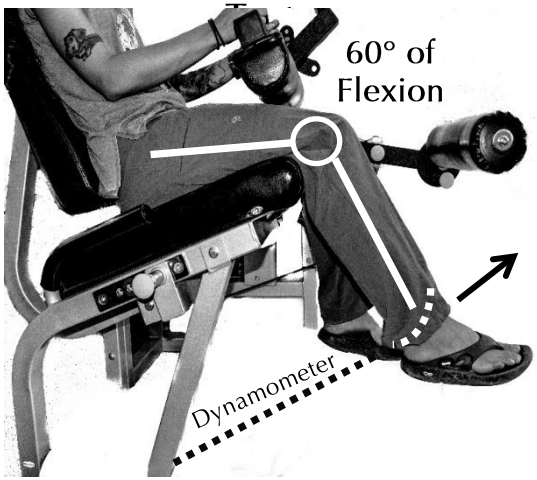
Appendix B: The Stork Test

Appendix C: Isometric Single Leg Leg Press



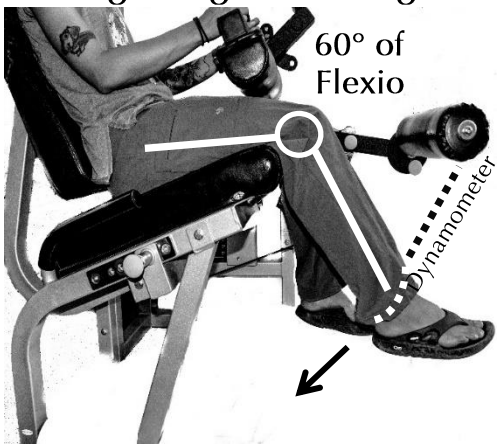
- Adjust foot and leg press position so that the knee is in 60 degrees of knee flexion when there is no slack in the dynamometer attachment.
- Perform maximal effort isometric tests per leg.

Appendix D: Isometric Single Leg Quadriceps



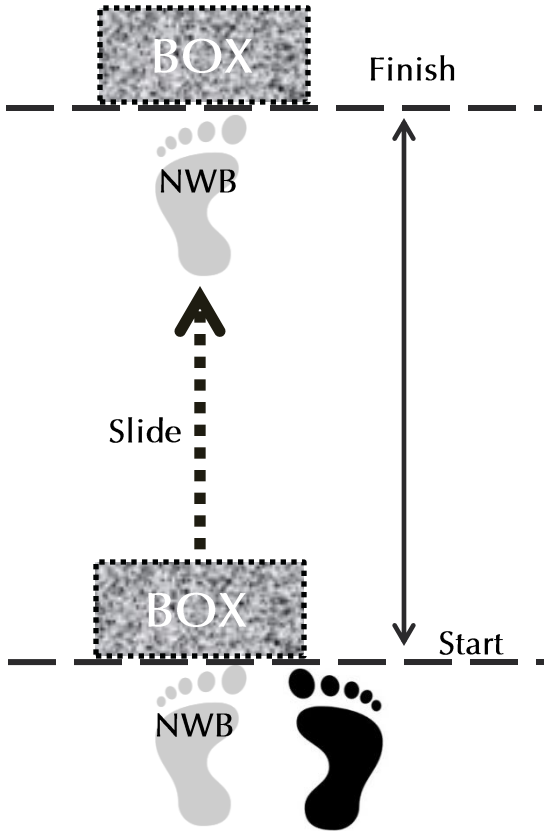
- Adjust seat position and dynamometer length so that there is no slack in the dynamometer attachment when the knee is in 60° knee flexion.
- Perform max effort isometric tests per leg.

Appendix E: Isometric Single Leg Hamstring

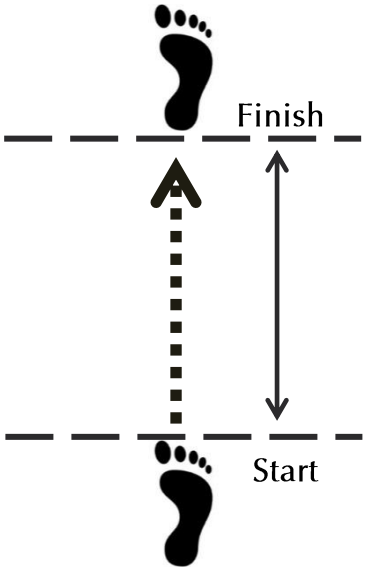


- Adjust seat position and dynamometer length so that there is no slack in the dynamometer attachment when the knee is in 60° knee flexion.
- Perform maximal effort isometric tests per leg.

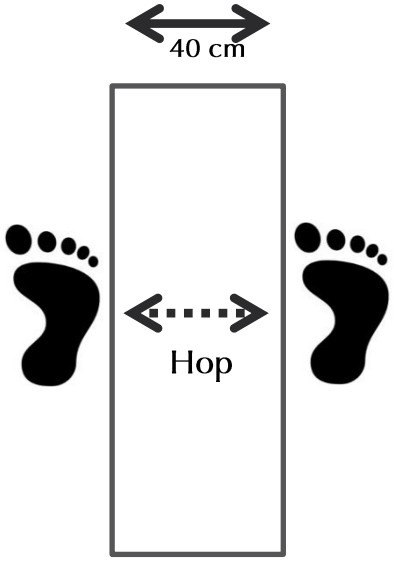
Appendix F: Anterior Reach Test (cm)



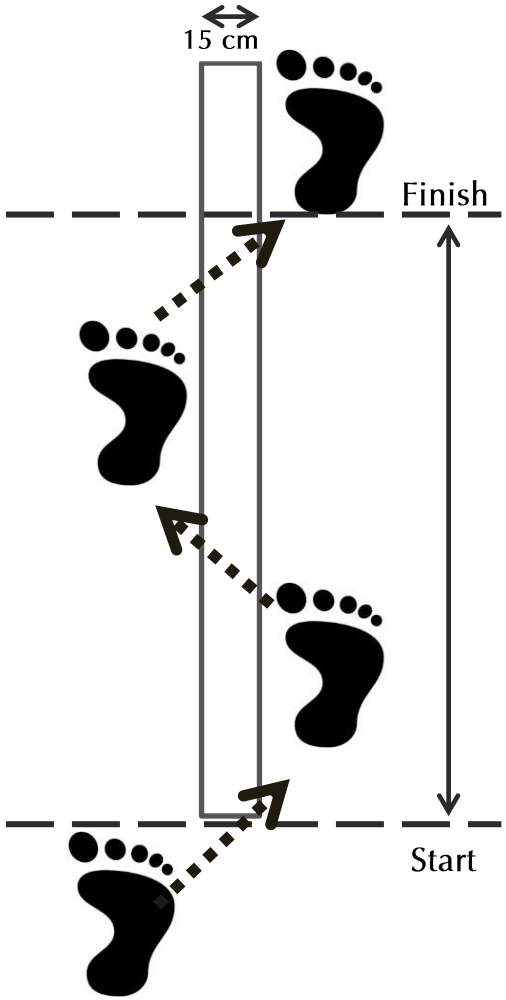
Appendix G: Single Leg Hop Test



Appendix H: Single Leg Timed Side Hop Test



Appendix I: Crossover Hop



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