Rehabilitation Precautions:
***All restrictions and/or precautions will be set by the referring surgeon, and will be based upon the stability of the repair and procedure performed. All precautions are subject to change per physician instructions.

General Precautions:
Dr. Kaeding:
- Brace is locked to block flexion beyond what is tolerated by the repair, 0-6 weeks. This will be set by Dr. Kaeding in the O.R.
- 6-8 weeks post-op, push ROM to full flexion, blocking brace at just beyond what is achieved in therapy.
- Discontinue brace once full flexion is achieved and once patient can perform SLR without extensor lag, after 6-8 week post-op period.

Dr. Flanigan:
- WBAT with knee brace locked at 0° for 6 weeks.
- ROM during first 6 weeks based on stability of repair as tested in OR- usually 0° to 60-90°.
- At 6 weeks progress ROM without restriction.
- Brace unlocked at 6 weeks post-op, and discontinued once full flexion achieved and patient can perform SLR without extensor lag.

Dr. Jones/Dr. Bishop:
- NWB with knee brace locked at 0° for 6 weeks. Pt. may slowly progress to WBAT with brace locked, with crutches, per physician and therapist discretion.
- PROM may begin at 2 weeks post-op, progressing 20° every 4-5 days, with goal of 90° flexion achieved by the 5-6 week post-op period.
- Brace unlocked fully by 6 weeks, and discontinued once full flexion is achieved and patient can perform SLR without extensor lag.

Additional Precautions:
- For quadriceps tendon repair, no terminal/end-range quad stretching x 8 weeks.
- No isolated, open-chain isotonic quadriceps strengthening for either repair x 8 weeks.
- All progression based on soft tissue healing.

Weeks 0-2 (Days 1-14):
- Weight-bearing as described above
- Prone knee passive ROM to 60-90° (or per surgeon restrictions – please see above)
- Supine passive knee ext to 0°
- Gentle medial and lateral patellar mobilizations
- Ankle pumps, gluteal sets, hamstring sets
- Modalities to control pain and edema
**Goals:**
1. Protect repair
2. Control pain and edema
3. Fair to good volitional quad activation

**Weeks 2-4 (Days 14-28)**
1. Continue weight bearing as described above
2. Continue focus on passive knee extension to 0°
3. Passive ROM for knee flexion per surgeon guidelines
4. May progress to active-assistive knee flexion (heel slides)
5. Gentle grade I- II patellar mobilizations. **Gently progress to superior and inferior mobilizations.**
6. Ipsilateral calf, hamstring and hip stretching (passive), with brace locked in extension.
7. Quadriceps sets – Begin with sub-maximal, progressing gently per patient tolerance.
8. Progress to 4-way SLR with brace locked in extension.
9. Seated ipsilateral hamstring curls, no resistance, within ROM restrictions
10. Continue modalities as indicated

**Goals:**
1. Protect Repair
2. Continue to manage pain and edema
3. Extension ROM to neutral, flexion to 45-60°
4. Normalization of gait, brace locked per physician, WBAT
5. SLR without extensor lag

**Weeks 4-6**
- Continue weight bearing as described above
- PROM / AAROM / AROM for knee flexion per surgeon guidelines
- Gently progress patellar mobilizations, all directions.
- SLR may be performed without brace if patient can perform without extensor lag.
- Seated ipsilateral hamstring curls, progressing to light T-band within ROM restrictions.
- Begin gentle core stabilization activities – abdominal brace with use of biofeedback as needed.
- Continue modalities as needed

**Goals:**
1. Continued ambulation with appropriate mechanics and without reactive effusion
2. Knee ROM to physician limits
3. Good scar quality and mobility

**Weeks 6-8:**
- Wean from extension brace per physician guidelines above
- Progress flexion ROM as tolerated to full flexion
- AROM knee extension and flexion
- Stationary bike
• Begin closed chain quadriceps strengthening- bilateral
• Weight shifts, progressing to single leg stance/ proprioceptive activities on firm surface
• Progress core and hip stabilization

Goals:
1. Restore full AROM and patellar mobility of the knee
2. Normalize gait without brace or assistive device
3. Initiation of resistive exercises without reactive effusion or pain

Weeks 8-12:
• May initiate terminal/end-range quadriceps stretching for quad tendon repairs
• Continue stationary bike for cardiac conditioning
• May initiate elliptical and/or stairmaster at 10 weeks
• Progress closed chain strengthening, bilateral to unilateral, eccentric to concentric
• Isolated isotonic quadriceps strengthening- leg extensions in protected range
• Proprioceptive activities - single leg stance on various surfaces
• Continue and progress core and hip stabilization

Goals:
1. Full ROM
2. Single leg stance for 30 seconds with good quad control
3. 5/5 strength of all other lower extremity musculature

Weeks 12-16:
• Continue lower extremity endurance exercises
• Continue quadriceps PRE’s per patient tolerance
• Initiate partial weight bearing plyometrics (e.g. shuttle) - bilateral to unilateral, straight plane to rotational
• May progress to bilateral FWB step downs, beginning with 2 inch block, if patient performs partial weight bearing plyometrics with good mechanics and no reactive effusion/pain
• Slideboard

Goals:
Appropriate mechanics with above activities, without pain or reactive effusion

Weeks 16-24:
• May initiate recreational swimming
• Initiate sports-specific exercise
• Progress hop downs bilateral to unilateral – progress step height per patient tolerance and upon demonstration of normal mechanics/control
• Initiate jogging progression
Criteria to begin jogging:
- 20 single leg squats with good mechanics
- 5/5 isometric strength
- Perform 10 FWB single leg hops with good control, symmetric bilaterally
- >7/10 on IKDC confidence scale

- Progress to dynamic functional activities: Figure-8, zig-zag, sideshuffle, grapevine. Begin at 25-50% intensity.

Criteria to return to sport-specific drills and activities:
1. Full ROM and 5/5 lower extremity strength
2. >85-90% performance of involved side versus uninvolved on functional hop testing, e.g., single leg hop for distance; single leg 3-hop crossover test; 6-meter timed hop test
3. >85-90% performance during isokinetic strength testing of involved versus uninvolved side

References:

