

# Brandon Beamer M.D - *Orthopedic Sports Medicine Specialist*

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**Notes:**

**CV Exercise:** Biking  
Walking on treadmill

**Criterion for Progression:**

- 1) Minimal to no effusion/edema**
- 2) ROM equal to opposite LE**
- 3) Full patellar mobility**
- 4) Ambulate on level surfaces with normal gait**

**Phase III – Tissue Remodeling/Hypertrophy Phase (12-24 weeks)**

**Goals:** 1) Full knee AROM

- 2) Normalize eccentric quad control
- 3) Strength progression

**Exercise:** Advanced Strength/Proprioception/Balance  
Full squat/leg press/lunges to 100 degrees  
Single limb Squat  
Begin low impact exercise progression<sup>6,29,41</sup>

**CV Exercise:** Elliptical<sup>6,29,41</sup>  
Bike, Swim, Alter G

**Criterion for Progression:**

- 1) No pain or edema/effusion**
- 2) Full ROM**
- 3) 20 reps to 60 degrees single limb squat with eccentric control and good lower extremity alignment**
- 4) Quad strength >80% of uninvolved LE (10RM single leg press or isokinetically if available)**

**Phase IV – Sport Specific Training (weeks 24+): if desired by pt and cleared by MD**

**Goals:** 1) Begin sport specific drills

- 2) Normalize neuromuscular control
- 3) Normalize jumping/landing mechanics if indicated
- 4) Prepare for return to sport

**Exercise:** Advance agility progression  
Begin plyometric progression  
Progress on running progression/sport-specific training

**Criterion for Return to Sport: (Recommend combination testing of strength, agility, and power according to available resources/clinic setting)**

- 1) No pain or swelling
- 2) Hop Tests – Single Hop, X-Hop, Triple Hop, Timed Hop  $\geq$ 85% uninvolved
- 3) Single leg squat to 60 degrees knee flexion with good control for 3 minutes
- 4) Quad strength > 90% of uninvolved (10RM leg press or isokinetic testing)
- 5) IKDC (MCID 6.3@ 6mo; 16.7 @ 12 mo)

**Estimated Return to Sport / Work:**

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## Weight Bearing

- NWB x \_\_\_\_ wks
- TDWB x \_\_\_\_ wks/days
- PWB \_\_\_\_% x \_\_\_\_ wks
- WBAT
- Brace Locked in Ext x \_\_\_\_ wks

## ROM

- Full ROM
- Locked full ext x \_\_\_\_ wks
- Locked at \_\_\_\_° x \_\_\_\_ wks
- ROM limits
- \_\_\_\_° to \_\_\_\_° x \_\_\_\_ wks
- \_\_\_\_° to \_\_\_\_° x \_\_\_\_ wks
- \_\_\_\_° to \_\_\_\_° x \_\_\_\_ wks
- \_\_\_\_° to \_\_\_\_° x \_\_\_\_ wks

## CPM

- \_\_\_\_° to \_\_\_\_° x \_\_\_\_ wks
- 30-70° ↑10°/d @ dir
- None

## Recommended Clinical Guidelines

TDWB 4-6 weeks<sup>6,18</sup>

No ROM restriction

CPM 4-6 hours/day x 6-8 weeks<sup>6,30,40</sup>

## Precautions

No impact x 12 weeks

## Osteochondral Allograft/Autograft Transplantation (OATS)

### Phase I – Tissue Protection/Healing Phase (0-6 weeks)

- Goals:**
- 1) Reduce pain and effusion
  - 2) Restore patellar mobility
  - 3) Minimize scar adhesion formation
  - 4) Restore normal knee ROM
  - 5) Facilitate quadriceps activation
  - 6) Protect graft from excessive shear and compression

**ROM:** PROM/AAROM/AROM (per MD limits)<sup>6,30,40</sup>  
Bike: Rocking to full revolution as ROM allows

**Exercise:** Quad Isometrics<sup>21</sup>  
SLR – 4 way (flex/abd/ext/add)<sup>5,20,26,31</sup>  
Clamshells<sup>31</sup>  
LAQ/SAQ<sup>12,25,38</sup>

**Manual:** Patella Mobilizations<sup>1,9,10,15,22,</sup>  
Patellar tendon Mobilizations<sup>1,9,10,15,22,</sup>  
Extension with Overpressure<sup>9,10,22,24</sup>

**Modalities:** Functional Electrical Stimulation<sup>33-35</sup>  
Biofeedback<sup>42</sup>  
Cryotherapy<sup>3,4,19,28,43</sup>

**CV exercise:** Aquatherapy (once incisions healed)

### Criterion for Progression:

- 1) *Voluntary quadriceps isometric contraction*
- 2) *No extensor lag with SLR*
- 3) *Good patellar mobility*
- 4) *Knee ROM 0-130 degrees*
- 5) *Minimal effusion*

### Phase II – Tissue Proliferation Phase/Progression Phase (6-12 weeks)

- Goals:**
- 1) Pain and edema control
  - 2) Achieve full knee ROM
  - 3) Strength progression – develop functional quad control
  - 4) Normalize gait

**ROM:** PROM/AAROM/AROM<sup>6,30,30</sup>  
Bike for ROM

**Exercise:** Gait retraining/Cone walking<sup>24</sup>  
Squats/Leg press to 60<sup>10,12,22,25,27,36,38</sup>  
Closed chain Terminal Knee Extension (stand)  
Calf raises  
Weight Shifting/Balance/ Perturbation Training<sup>7,8,27</sup>  
Bridging progression  
Step ups, Step Downs, Lateral Step Downs<sup>8,9,10,12,25,38</sup>

**Manual:** Scar mobilization<sup>1,2,9,10,15,22</sup>  
Patellar mobilization<sup>1,2,9,10,15,22</sup>

**Modalities:** Continue PRN