## Rehab Practice Guidelines for: *Unilateral Total Knee Arthroplasty (TKA)*

**Primary Surgery:** Tricompartmental, TKA-any approach

**Assumptions:** 3-4 weeks post-tricompartmental TKA, up to 1 week of inpatient rehabilitation after acute care stay, up to 2 weeks (4-6 visits) of home physical therapy\(^1\,2\,5\)-6.  
**Assumptions for outpatient physical therapy:** Active range of motion (AROM) approaching 90° of knee flexion, minimal pain/swelling, independence in mobility in and out of home.  
**Expected number of visits:** 16-18 visits

<table>
<thead>
<tr>
<th>Time</th>
<th>Treatment(^2)</th>
<th>Milestones</th>
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<tbody>
<tr>
<td><strong>Early</strong></td>
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</table>
| 3-6 Weeks Post-Operatively Visits 1-6 | **ROM\(^2\)**  
• Exercise bike for 5-10 minutes, forward and backward pedaling with no resistance until able to perform full revolution  
• Supine, active-assistive wall slides or prone quadriceps stretch with strap for knee flexion  
• Passive knee extension stretch with manual pressure or weights (seated bag hang, or prone bag hang)  
• Patellar mobilizations for 3 sets of 10 reps of inferior, superior glides, medial, and lateral glides as necessary\(^3\)  
NMES\(^1\,2\,5\,6\): See end note for guidelines  
Volitional Strength\(^2\)  
• Strengthen at 70% of 8 RM with 3 sets of 8 reps for all strengthening exercises  
• Initial exercise examples: SLR, hip abduction sidelying, SAQ, step-ups at 5-15 cm, 45° wall slides or sit to stand, standing TKE with Theraband™ for resistance from 45-0°  
• Increase step height if good concentric/eccentric control | AROM/PROM 0° to >105° of flexion\(^2\)  
Minimal to no pain and swelling\(^2\)  
Voluntary quadriceps muscle control or 0° knee extension lag\(^2\)  
Heel strike/push off achieved with least restrictive device.  
Begin focusing on TKE in stance phase of gait.  
Obtain baseline isometric quadriceps index, and activation with a superimposed electrical stimulation burst within the first week of outpatient PT. |
| **Mid**       |                                                                               |                                                                           |
| 5-8 Weeks Post-Operatively Visits 7-12 | **ROM\(^2\)**  
• Exercise bike for 5-10 minutes, add resistance if able to perform full revolution, lower seat height to produce stretch with each revolution  
• Continue ROM activities as described in early treatment section with increased duration until milestones are achieved  
NMES\(^1\,2\,5\,6\): See end note for guidelines  
Volitional Strength\(^2\)  
• Continue to progress exercises if able to perform 3 sets of 10 reps of the exercise correctly with maximum fatigue Progression:  
  • Progress from 8RM to 10 RM  
  • Reassess 10RM weekly and exercise at 65% - 70% 10RM | Consistent with carryover of AROM 0° to >115°  
Collaborate with surgeon if by 4-6 weeks post-op carryover of AROM in flexion is less than 10°-15° from initial outpatient PT evaluation measurement.  
Steady increase in MVIC\(^3\) |

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Exercise examples: Leg press and leg extension at 65-70% 1 RM, 4-way hip exercises with resistance, climbing a flight of stairs, walking with change in speed and incline.

<table>
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<tr>
<th>Late</th>
<th>ROM(^2)</th>
<th>AROM 0-120(^\circ)</th>
</tr>
</thead>
<tbody>
<tr>
<td>7-10 Weeks Post-Operatively Visits 13-18</td>
<td>Continue as previously described until milestones are achieved</td>
<td>Walk foot over foot up and downstairs without assistive device</td>
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<td></td>
<td>NMES (^1) See end note for guidelines</td>
<td>Unlimited walking distance with normalized gait and least restrictive device</td>
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<td>Volitional Strength(^3)</td>
<td>Retest isometric quadriceps index and activation.</td>
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<tr>
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<td>Continue to progress exercises if able to perform 3 sets of 10 reps of the exercise correctly with maximum fatigue</td>
<td>• Quadriceps at 70% strength of uninvolved side</td>
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</tbody>
</table>

**ROM:** range of motion; **AROM:** active range of motion; **PROM:** passive range of motion; > greater than; reps: repetitions; SLR: straight leg raise; RM: repetition maximum; TKE: terminal knee extension; SAQ: short-arc quadriceps; MVIC: maximum volitional isometric contraction; PT: physical therapy

**Pain and swelling**
Ice, compression, and elevation daily after exercises\(^{1,2,5-6}\)

**Incision mobility**
Soft tissue mobilizations to entire length of incision with greater emphasis on distal 1/3 of incision\(^{1,2,5-6}\) until incision moves freely over subcutaneous tissue\(^3\)

**Vital Signs**
Monitored during each session\(^2\)

**NMES Protocol Guidelines\(^{1,2,5,6}\)**
- Electrodes placed over proximal lateral quadriceps and distal medial quadriceps
- Stimulation Parameters: 250-400 usec, 50-75 Hz, 2 second ramp, 12 second on, 80 second off, intensity to maximum tolerable or at least 30% of the maximum volitional isometric contraction (MVIC), 10 contractions per session
- 3 sessions per week until quadriceps strength MVIC is 70% of uninvolved.
- Performed isometrically at 0-60 degrees of knee flexion—dependent on tolerance and therapeutic goal (ie. near max extension for quad lag, etc.)

**References**

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