The Use of Therapeutic Exercises and Manual Stretching for a Patient Following a Total Knee Arthroplasty (TKA) Revision: A Case Report

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Background
- Total knee arthroplasty (TKA) is an orthopedic surgery involving the total replacement of compartments of the knee joint.
- Osteoarthritis (OA) is the most common reason for TKA.
- Risk factors for OA: obesity, sports-related injuries, and genetics.
- The artificial knee joint typically lasts between 15-20 years.
- Early failures may occur due to loosening of artificial components, infection, fractures, and instability.
- The approximate number of TKA procedures performed annually is 581,000.
- By 2030, the demand for TKA procedures is expected to grow by 673%.

Purpose
To document the potential benefits of prescribed PT interventions, including therapeutic exercise and manual stretching, for a patient who underwent TKA revision. The setting of this rehabilitation process was a skilled nursing facility.

Case Description
- 69 yo female patient status post right (R) TKA revision.
- Original R TKA procedure: 2005 (due to Osteoarthritis).
- History of several subsequent R TKA procedures, with the latest being her eighth.
- Latest procedure: R TKA revision due to aseptic loosening of components.
- Prior level of function: fully independent.
- Chief complaints: pain, swelling, and decreased ROM at the right knee.
- Goals: regain prior level of function and be able to live at home safely and take care of her dog.

Interventions:

<table>
<thead>
<tr>
<th>Phase 1 (days 1-7)</th>
<th>Phase 2 (days 8-15)</th>
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<tbody>
<tr>
<td>Quad sets (supine)</td>
<td>R LE: 3 sets x 15 reps with 0 lb weight</td>
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<tr>
<td>Straight leg raises (supine)</td>
<td>L LE: 3 sets x 15 reps with 2.5 lb weight</td>
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<tr>
<td>Clamshells (side-lying)</td>
<td>R LE: 3 sets x 15 reps with red TB</td>
</tr>
<tr>
<td>Short arc quads (supine)</td>
<td>R LE: 3 sets x 15 reps with 1.5 lb weight</td>
</tr>
<tr>
<td>Hamstring curls (seated)</td>
<td>L LE: 3 sets x 15 reps with 2.5 lb weight</td>
</tr>
<tr>
<td>Heel slides with towel (supine)</td>
<td>R LE: 3 sets x 15 reps with red TB</td>
</tr>
<tr>
<td>Manual stretching R knee (supine)</td>
<td>5&quot; hold x 10 reps</td>
</tr>
</tbody>
</table>

Results
- Goniometry (AROM): R knee: 7-42 degrees
- Numeric Pain Rating Scale: Best: 4, Worst: 7
- A/P circumference of R patella: 16.5°
- Timed Up and Go (TUG): 23 seconds (FWW), 14 seconds (with FWW)

Discussion
- It appears as though therapeutic exercise and manual stretching were beneficial interventions based on the results of the outcome measures.
- Her chief complaints of pain, swelling, and decreased ROM at the right knee were improved upon discharge.
- The patient agreed to follow up with outpatient PT following discharge in order to address remaining impairments.
- With the projected increase in TKA procedures, it is necessary to continue researching optimal interventions for maximizing knee function and performance.
- Future research should be conducted regarding the long-term benefits of these interventions.

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