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
- Approximate number of TKA procedures performed annually: 581,000
- Risk factors for OA: obesity, sports-related injuries, and genetics

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 y/o 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

Systems Review
Cardiovascular/Pulmonary
- Not impaired

Musculoskeletal
R LE: AROM: impaired, limited flexion & extension
R LE MMT: DNT

Integumentary
Surgical incision, anterior midline of R LE, 8.5 inches long, 21 stitches used

Neuro
Numbness slightly inferior and lateral to patella

Communication, Affect, Cognition
- Not impaired

Interventions
<table>
<thead>
<tr>
<th>Description</th>
<th>Phase 1 (days 1-7)</th>
<th>Phase 2 (days 8-15)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quad sets (supine)</td>
<td>5&quot; hold x 20 reps</td>
<td>Discontinued day 11</td>
</tr>
<tr>
<td>Straight leg raises (supine)</td>
<td>R LE: 3 sets x 15 reps with 0 lb weight L LE: 3 sets x 15 reps with 2.5 lb weight</td>
<td>R LE: 3 sets x 20 reps with 2.5 lb weight L LE: 3 sets x 20 reps with 4 lb weight</td>
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<tr>
<td>Clamsheils (side-lying)</td>
<td>3 sets x 15 reps with red TB</td>
<td>Standing hip abduction: 3 sets x 10 reps</td>
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<tr>
<td>Short arc quads (supine)</td>
<td>R LE: 3 sets x 15 reps with 1.5 lb weight L LE: 3 sets x 15 reps with 2.5 lb weight</td>
<td>R LE: 3 x 20 reps with 3 lb weight L LE: 3 x 20 reps with 4 lb weight</td>
</tr>
<tr>
<td>Hamstring curls (seated)</td>
<td>3 sets x 15 reps with red TB</td>
<td>3 reps x 20 reps with blue TB</td>
</tr>
<tr>
<td>Heel slides with towel (supine)</td>
<td>3 sets x 10 reps</td>
<td>3 sets x 20 reps</td>
</tr>
<tr>
<td>Manual stretching R knee (supine)</td>
<td>30&quot; hold x 3 reps in flexion/extension</td>
<td>PNF contract-relax</td>
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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 R knee flexion 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.
- Further research should be conducted regarding the long-term benefits of these interventions.

Acknowledgements
- The author acknowledges Amy Lakers, PT, DPT, for assistance with case report conceptualization, the clinical instructor Kyle Nesser, DPT, for supervision on the case, and the patient for willingness to participate in the data collection of the case report.

References

The surgical incision 4 days post surgery (Figure A) compared to the incision 6 days post surgery with the sutures removed (Figure B).

Results at Initial Evaluation
<table>
<thead>
<tr>
<th>Goniometry (AROM)</th>
<th>Numeric Pain Rating Scale</th>
</tr>
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<tbody>
<tr>
<td>R knee: 7-42 degrees</td>
<td>Best: 7</td>
</tr>
<tr>
<td>Current: 8</td>
<td>Worst: 10</td>
</tr>
<tr>
<td>A/P circumference of R patella: 16.5&quot;</td>
<td>15°</td>
</tr>
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Tests and Measures

Discussion

Level of Independence

Functional Mobility Progression

Discussion

Acknowledgements

References