“Leg exercises when I’ve just had knee replacement surgery? No thanks!”

Quality Improvement Project 2013-2016
Surgical Ward, Coffs Harbour Health Campus
MNCLHD

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Reasons for the QI project

- Literature searches for post-operative exercise.
- Idea of patients ‘exercising’ with a painful leg.
- Inconsistent/misleading advice from staff.
- Importance of Knee ROM for daily function.
Exercise sheet passed down through the ages ......

<table>
<thead>
<tr>
<th>TOTAL KNEE REPLACEMENT EXERCISES</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ANKLE EXERCISES</strong></td>
</tr>
<tr>
<td>Move toes up and down and around in a circle</td>
</tr>
<tr>
<td><strong>DEEP BREATHING AND COUGHING</strong></td>
</tr>
<tr>
<td>Take five deep breaths and then cough every hour. This helps to prevent lung complications after your surgery.</td>
</tr>
<tr>
<td><strong>BUTTOCK EXERCISES</strong></td>
</tr>
<tr>
<td>Squeeze buttock muscles together. Hold for 5 seconds, relax for 5 seconds.</td>
</tr>
<tr>
<td><strong>KNEE STRAIGHTENING/EXTENSION</strong></td>
</tr>
<tr>
<td>Place small roll under ankle, tighten thigh and press knee down. Hold for 10 seconds.</td>
</tr>
<tr>
<td><strong>LEG STRENGTHENING (Inner Range Quads)</strong></td>
</tr>
<tr>
<td>Place roll under knee, pull toes back and lift foot into air. Keep knee on roll.</td>
</tr>
<tr>
<td><strong>LEG STRENGTHENING (Straight Leg Raise)</strong></td>
</tr>
<tr>
<td>Pull toes back, stiffen knee, slowly lift leg off bed and lower down.</td>
</tr>
<tr>
<td><strong>KNEE BENDING</strong></td>
</tr>
<tr>
<td>Lying down: Slide heel towards buttocks</td>
</tr>
<tr>
<td><strong>KNEE BENDING</strong></td>
</tr>
<tr>
<td>Sitting: Slide foot back as far as possible under chair.</td>
</tr>
<tr>
<td><strong>KNEE BENDING</strong></td>
</tr>
<tr>
<td>Standing: Hold onto chair and pull heel towards bottom</td>
</tr>
<tr>
<td><strong>10 REPETITIONS OF EACH EXERCISE</strong></td>
</tr>
<tr>
<td>5 TIMES A DAY</td>
</tr>
</tbody>
</table>
At physiotherapist review: “How are you managing the exercises?”

Common patient responses:

“What exercises?”

“Yes, fantastic – I can wiggle my feet!”

“I’m squeezing my buttocks a lot!”

“Knee bending? No, I’ll do that when there’s no more pain.”

“I did lots of exercise before my surgery. Now I’m too weak I can’t even lift my leg!”
A painful knee and exercise....
Misleading advice post-operatively....

- Orthopaedic rounds
- Acute Pain Service (APS) rounds
- Local culture/history
Knee ROM and daily function....

- Getting out of bed
- Standing up and sitting down
- Basic functions before surgery
- Knee ROM at discharge from hospital
Recovery of ROM and easing of daily function

- Sign/poster + encouragement from all staff.
- Feedback to find ideal strategies for PT.
THE PAINFUL LEG AFTER KNEE REPLACEMENT SURGERY

Helping your recovery and preventing stiffness of your 'new' knee joint requires frequent....

BENDING*,

STRAIGHTENING,

and WALKING.

* unless advised otherwise by your surgeon.
Are there ideal PT strategies?

- PT brain-storming sessions
- Medical record audits
- Patient experiences
- Reflection: trauma/injury warrants basic first aid!
Some observations: hospital length of stay (LOS) 0.3 days shorter for unilateral TKRs.
Some observations: hospital length of stay (LOS)
3.2 days shorter for bilateral TKRs
Some observations: MUA

Manipulations Under Anaesthetic (MUA) since 2011

- 2011 (5)
- 2012 (7)
- 2013 (3)
- 2014 (6)
- 2015 (8)
- 2016

TKR QI Project 28OCT14

New PT Approach 20NOV15
PT strategies derived – the detail....

New PT approach for TKR inpatients (acute phase).

1) ‘TKR sign’ placed on patient tables on Day 0.
   - Including those admitted to HDU.
   - No need PT assessment/treatment unless EMOS patient, or at patient request!
2) No formal prescription of “exercises” unless deemed appropriate for individual patients.
3) PT intervention/advice:
   ➢ Initial PT assessment:
     A. Provide plenty of re-assurance:
        1) Pain is normal/expected after major surgery. The body’s natural pain response is to protect the traumatized area. However...
        2) Movement at the knee joint is essential, as the onset of stiffness may be rapid.
        3) Inflammation is normal and may add to pain sensation and/or swelling.
     B. Assisting patient mobility - education about the basics:
        1) First time sitting on bed edge: let the knee bend (or let the leg dangle over). Let the thigh muscles relax. Do not overwork thigh muscles by holding leg straight + stiff. This only prolongs the pain.
        2) Before standing use the operated leg in the same way as the non-operated one (i.e., try to slide the foot back close to underneath the knee).
        3) While sitting: as for standing (see above) but relax the thigh muscles and let the knee bend as it normally would.
        4) Walking: aim to increase weight-bearing on the operated leg. Try to extend at the knee joint at every and of swing phase.
     ➢ At follow-up PT sessions:
        A. Re-assurance and education as per (A) and (B) above.
        B. Focus advice on function and a good daily routine:
           1) Aim for full and normal movements that were achieved before surgery. Use the non-operated knee as a guide to what normal movements are.
           2) Bend the knee as much as possible to facilitate ease of basic activities: standing up from bedside, chair or toilet. Use the non-operated leg as a model.
           3) Bending is easiest on bed edge or sitting on a chair. Straightening is easiest during walking.
           4) Walking long distances is not necessary. Instead, aim for short distances (e.g., 10—50m) frequently (e.g., every 1—2 hours) — gradually with more weight-bearing on operated leg.
           5) Essential to include rest in the daily routine. Rest in bed with leg elevated (30—60 minutes). Ice (cryotherapy) may be applied to ease pain and help decrease swelling.
           6) Re-assurance about inflammation: onset may be delayed (e.g., Post-op day 2 onwards) and is not a sign of “overdoing it.”

7) Ask patients for their ideas on how to bend the knee more. If they don’t know how, offer suggestions either or both:
   a) use the foot/ankle of non-operated leg to gently push the other one backwards.
   b) place the foot (operated leg) on the ground as far back as possible. Then gently shuffle the bottom/thigh forward while keeping the foot planted.

8) Other techniques sometimes used to assist mobility of:
   - Active assisted (AAROM) knee ext. either patient using non-op. leg or PT assisting.
   - Facilitate ‘loosening’ knee joint by patient gently swinging the leg whilst on bed edge and height raised (feet of the ground).
   - PNF by PT, either quadriceps stretch or hamstrings activation (vice versa or both).
   - Active knee flexion plus overpressure by PT - use this with caution!!

9) Encourage independence.
   Remind that as PT, as well as assisting the ability to perform ADLs independently.
   ➢ At final PT session:
      (e.g., upon discharge or as some remain inpatients due to BNO, wound care, etc.):
      A. Remind patient routine best suited at home:
         Walk short dist. regularly, move at knee joint, rest leg elevated +/- ice.
      B. Encourage more bend as well as achieving full straightening.
         At patient request, a small printout may be provided - simply a reminder of all the basics.
      C. Re-assure that inflammation may persist or worsen.
         - Continue routine with more or prolonged rest periods.

Special note for bilateral TKR patients
* STIS from bed and chair is usually the biggest challenge.
  - re-assure patients that as knee movement improves so too does ability to stand.
* Foot planted, bottom shuffle forward is very useful.
* Manual assistance (STIS initially, AAROM, PNF) from PT is usually required.

Special note for those with restricted “active flexion”
* All the re-assurance and education principles should still be explained.
  * Intervention/advice should be the same as per initial PT assessment.
  * Then, flu and final PT sessions should be modified accordingly.
PT strategies derived – an outline.

New PT approach: TKR inpatients - OUTLINE.

› TKR sign on Day 0.

› Initial PT assessment.
  - re-assurance: pain/movement/inflammation
  - leg dangling/relaxing over bed edge
  - foot position/ankle relaxation for standing/sitting.
  - WBg and knee EXT when walking.

› Follow-up PT sessions.
  - re-assurance and education a/a.
  - normal movement at knee for basic functions.
  - routine to follow: short walks, move the knee, rest with elevation.
  - remind about inflammation: may be delayed, not sign of "overdoing it".
  - empower patients with ways to improve movement: other foot/ankle or bottom shuffle.
  - remind that ADLs are easier with better knee movement. Encourage independence.
  - PT techniques applied if needed.

› Discharge from PT
  - encourage goals for home: more bend, full straightening.
  - remind about inflammation.
  - remind about the routine to follow at home and not to forget rest.
After more feedback ....

How to gain more from your knee replacement surgery....

After discharge from hospital,

walk short distances frequently,

bend more and more,

straighten fully,

and remember rest periods with leg elevated!
Other observations: Pre-op education/exercise sessions and LOS.

(28OCT14-28OCT15, n=158: Other Hospital PT includes Armidale, Bellingen, Dorrigo, Grafton, Kempsey, Macksville, Maclean and Taree)
What next?

Research ideas for other sites

- Signage or change of PT approach or change of culture?
- Improved patient satisfaction with hospital stay?
- Cryotherapy (bag of ice) + education?
- Basic first aid + pain understanding/tolerance = ↓ medication?
- Other forms of education/preparation pre-op?
Summary

After TKR at CHHC,

Painful leg?

No exercise, but TLC + normal knee movement....

....for a better recovery!
References


Additional slides if time allows!

- Medical record audit: PT interventions and knee ROM
Ideal PT strategies? Medical Record audit July 2013-June 2014

**PT Treatment TYPE KEY**
- **AROM** or Active, knee ext in gait, AROM knee X
- **AAROM** or Active-assisted, a/active - H/Ext assisted
- **PROM** or Passive
- **IRQ** or SLR or assisted SLR
- **General exercise** or LLX, ROM X, bed X, chair X, checked X, knee f/i, knee stretches, glutes, DBE, circ X, SQ, SG

**Education/advice** or prompt/encouraged/ROM r/v sheet given
- **P/mF** or hold/relax
Ideal PT strategies? Medical Record audit 28OCT14-28APR15

**Documented PROM** 47/71 = 66%

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- AAROM or Active assisted, a/arrive, H/F at assisted
- PROM or Passive
- IRQ or SLR or assisted SLR

**General exercise** or L/L, ROM X, bed X, chair X, checked X, knee F/T, knee stretches, gait, P/PE, dire X, SCI, SG

**Education/advice** or prompt/encouraged/ROM r/v sheet given

**PMF or hold/relax**
## Some observations: knee ROM at discharge (passive)

<table>
<thead>
<tr>
<th>Passive Range of Motion (PROM) at knee joint</th>
<th>Average Flexion (degrees)</th>
<th>Documented by Physiotherapists</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 year prior to QI (01JUL13-30JUN14)</td>
<td>84.14</td>
<td>27% (42/153)</td>
</tr>
<tr>
<td>1 year of QI (28OCT14-28OCT15)</td>
<td>84.69</td>
<td>63% (100/158)</td>
</tr>
</tbody>
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