Objectives

• (1) Recognize interventions that improve total joint replacement recovery.
• (2) Identify benefits of a fast track joint replacement rehab interventions/protocol.
• (3) Understand the new standard of care on total joint replacements.
How many of you have worked with individuals who have had a hip/knee replacement?

Facts on OA

- 70 million affected by arthritis in the US [1]
- Osteoarthritis affects 21 million over 45 years old
- Knee joint is the number one joint affected
- 1 million individuals are diagnosed each year (~10 Saturdays at memorial stadium).  
- Arthritis affects about everyone over 75 years old
Risk Factors for OA

- Injury or Repetitive movements [1]
- Obesity
- Gender
- Age
- Genetics
- Race (decreased risk for Asian).

Treatment for OA

- Weight loss [1]
- Medication (pain relievers)
- Braces and/or AD's
- Physical therapy
- Increasing physical activity
- Surgery
Looking at the numbers

- 687,000 total knee arthroplasties (TKAs).
- 300,000 total hip arthroplasties (THA’s).
- Estimated by year 2030 there will be 1.3 million TKA. Costing ($23,000 – $27,000)

Deficits Post-op

- Quadricep strength drops to 60% after TKA [2]
- Quadricep strength drops to 30% after THA
- Functional performance declines by up to 88%.
- 18% slower walking speed.
- 51% slower stair climbing speed.
How do we improve the deficits?

Characteristics of an Accelerated Rehab Program. (Objective 1)

• Pre-operative patient education.
• Fast track rehabilitation (Multidisciplinary)
• Surgery that is minimally invasive
• Resisted exercises that are progressive
Work as a team!

Multidisciplinary Approach

- Improve analgesia intake
- Decrease surgical stress response (time and size of wound).
- Decrease organ dysfunction (sickness)
- Increase functional mobility
- Improved ability to eat and return to normal diet
Role of the Physical Therapist

- Good Communication
- Progressive resisted exercises
- Functional strengthening
- Education

“Old” vs. New Rehabilitation (Objective 3)

- Old
  - Muscle specific exercises
  - Single plane interventions
  - Voluntary Muscle contraction
- New
  - Multiple muscle exercises
  - Multiple plane interventions
  - Involuntary muscle contractions
Benefits of a Fast Track Rehab Program? (Objective 2)

- Cost savings [3]
- Length of stay is decreased
- Decreased risk for DVT’s, PE’s, and urine retention
- Decreased mortality rate.
- Discharge to skilled nursing is reduced.
- Improved patient satisfaction

A Closer Look at Cost-Effectiveness

- Study in Denmark – Randomized clinical trial [4]
- Total hip/knee replacements
- 87 participants
- Comparing accelerated and intensive program vs. standard protocol
- 12 month study
Results of the Study.....

- ~$4,000 US dollars in cost savings [4]
- 4 patients readmitted (standard protocol)
- 2 patient readmitted (accelerated protocol)

Research Study: Benefits of Early Treatments

- Retrospective study [5]
- PT0 (295) and PT1 (392).
- Results:
  - Increased level of performance (measured by steps walked)
  - Decreased opioid consumption
  - LoS was lower
  - Discharged home vs SNF
How do we measure progress?

Functional Outcome Measures

- TUG Test
- LEFS
- 5xSTS
- 2MWT and 6MWT
5xSTS

<table>
<thead>
<tr>
<th>Measurement (n)</th>
<th>Minimum – Maximum</th>
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<tbody>
<tr>
<td>Mean: All Ages</td>
<td>4.0 - 16.0 seconds</td>
</tr>
<tr>
<td>Mean: 19-49</td>
<td>4.1 - 11.5 seconds</td>
</tr>
<tr>
<td>Mean: 50-59</td>
<td>4.4 - 9.1 seconds</td>
</tr>
<tr>
<td>Mean: 60-69</td>
<td>4.0 - 15.1 seconds</td>
</tr>
<tr>
<td>Mean: 70-79</td>
<td>4.5 - 15.5 seconds</td>
</tr>
</tbody>
</table>

TUG Test

<table>
<thead>
<tr>
<th>TUG score (sec)</th>
<th>Functional Mobility Skill</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;20 seconds</td>
<td>Independent for basic transfers</td>
</tr>
<tr>
<td>&gt;30 seconds</td>
<td>Dependent on transfers</td>
</tr>
</tbody>
</table>
2MWT and 6MWT

• 2 minute walk test
• 6 minute walk test

Lower Extremity Functional Scale

• Questionnaire containing 20 questions.
• Measures a patient's ability to perform everyday tasks.
• MCID: 9 points (TKA and THA).
Outcomes After Surgery

- 90% report reduced rate of pain
- Improved functional mobility
- Increased QoL
- 85% report satisfaction after surgery
- Only 26% receive outpatient physical therapy

Summary

- Multidisciplinary Approach
- Patient education
- Benefits of an accelerated rehab program
  - Decreased LoS
  - Decreased Mortality
  - Cost Saving
  - Patient satisfaction increased
Summary Cont…

• New Standard of Care
  • Progressive resistive exercises
  • Functional strengthening

References

• 2) Bade M, Stevens-Lapsley J. Early high-intensity rehabilitation following total knee arthroplasty improves outcomes. Journal of orthopedics and sports physical therapy. 2011; 41:932-41
• 4) Larsen K et al. Cost-Effectiveness of accelerated perioperative care and rehabilitation after total hip and knee arthroplasty. JBJS. 2009;91:761-72
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- 12) Curry A, Goehring M, Bell J, Jette D. Effect of physical therapy interventions in the acute care setting on function, activity and participation after total knee arthroplasty: A Systematic review. JACPT. 2018;9(3):93-105
- 14) Bandholm T, Kehlet H. Physiotherapy exercise after fast-track total hip and knee arthroplasty: time for reconsideration? Arch Phys Med Rehabil 2012;93:1292-4
GO HAWKS!

GO HAWKEYES