Comprehensive Care for Joint Replacement (CJR)

WPTA Fall Conference 2016
Tiffany Houdek, PT, OCS
Rich Illgen, MD
Kip Schick, PT, DPT, MBA

Today’s Agenda
• CJR Overview – Kip Schick, PT, DPT, MBA
• Innovations in Total Joint Replacement Surgery – Rich Illgen, MD
• Considerations with Physical Therapist Practice – Tiffany Houdek, PT, OCS

Learning Objectives
• Attendees will be able to:
  – Explain the core elements of CJR, including the rationale for CJR implementation, the diagnoses included, the methodology used for CMS payment and adjustments, utilization of quality metrics, and partnership consideration
  – Recognize and understand how health care law changes may affect referral patterns to physical therapist practice.
  – Summarize the challenges and opportunities in the rehabilitation of patients with total joint replacement surgery across the continuum of care and the utilization of multiple models of care.

Learning Objectives
• Attendees will be able to:
  – Describe new surgical techniques and list surgical considerations that impact patient outcomes and its important to physical therapist practice
  – Apply current research to physical therapist practice in the area of pre-habilitation
  – Explain current treatment concepts as a component of physical therapist practice and how this impacts hospitals and other stakeholders participating in CJR
  – Discuss outcome parameters emphasized by CMS

CJR – What, Why, and Relevance
• CMS: “The Comprehensive Care for Joint Replacement (CJR) model aims to support better and more efficient care for beneficiaries undergoing the most common inpatient surgeries for Medicare beneficiaries: hip and knee replacements (also called lower extremity joint replacements or LEJR). This model tests bundled payment and quality measurement for an episode of care associated with hip and knee replacements to encourage hospitals, physicians, and post-acute care providers to work together to improve the quality and coordination of care from the initial hospitalization through recovery.”

CJR – What, Why, and Relevance
• CMS: “This alternative payment model will contribute to the Medicare goals set by the Administration of having 30 percent of all Medicare fee-for-service payments made via alternative payment models by 2016 and 50 percent by 2018. Effective implementation of the CJR model will improve the quality and efficiency of care for Medicare beneficiaries, which is essential to creating a health care system that delivers better care, spends our dollars more wisely, and leads to healthier Americans.”
**CJR – What, Why, and Relevance**

- **Additional CMS Payment Transitions:**
  - 85% of FFS payment tied to outcome measures by the end of 2016
  - 75% of payments will be value based by 2020
- **Quality Data:**
  - 85% of FFS payment tied to outcome measures by the end of 2016
  - 75% of payments will be value based by 2020

**CJR – What, Why, and Relevance**

- Authorized by the Affordable Care Act
- Final Rule published by CMS on November 16, 2015
- Why focus on total joint replacements? Most common inpatient admission for Medicare beneficiaries
- In 2014, utilization in the US and WI included 486K and 10K discharges, respectively totaling more than $7B and $122M, respectively
- Despite frequency and cost, quality variance also high

**CJR – What, Why, and Relevance**

- Rate of complications like infection or implant failure can be 3 times higher at some facilities
- Average cost per procedure ranges $16,500 - $33,000 (surgery, hospitalization, and recovery)
- Impacts 791 hospitals in 67 geographic areas (called Metropolitan Service Areas - MSAs)
- MSAs include counties with more than 50,000 in population and a core urban area
- Wisconsin has 2 MSAs: Madison and Milwaukee

**CJR – What, Why, and Relevance**

- Madison MSA counties: Dane, Columbia, Iowa, and Greene
  - Participating hospitals: Monroe Clinic, Divine Savior, St. Mary’s, UW Hospital
- Milwaukee MSA counties: Milwaukee, Ozaukee, Washington, and Waukesha
  - Participating hospitals: Waukesha Memorial, Columbia St. Mary’s (Milwaukee, Ozaukee), Aurora (Washington County, St. Luke’s, West Allis), Oconomowoc Memorial, St. Joseph’s West Bend, Wheaton Franciscan (St. Francis, St. Joseph, Franklin), Community Memorial, Froedtert, Orthopedic Hospital of WI, Columbia Center, Midwest Orthopedic Specialty Hospital

**CJR – What, Why, and Relevance**

- Hospitals accountable for Fee for Service (FFS) Part A and B costs of surgery, hospital admission, and care for 90 days post-discharge from the acute care hospital admission (includes related readmissions)
- Includes admitting DRGs 469 and 470
- CMS sets episode defined target prices for hospitals – includes inpatient costs and average post acute care for 90 days following acute care discharge (year 1 is 2/3 hospital specific, 1/3 regional and by year 4 is 100% regional)
- CMS includes exclusions for readmission and Part B care for unrelated conditions
- CJR is a 5 year pilot; year started April 1, 2016, and all following years follow the calendar year with CJR program ending December 31, 2020

**CJR – Specifics**

- CMS used past data to develop a target price that is unique to each individual hospital and includes a discount (i.e. savings to CMS)
- All providers and suppliers are paid under the usual CMS payment system rules and procedures
- At the end of a model performance year, actual spending for the episode (total expenditures for related services under Medicare Parts A and B) is compared to the Medicare target episode price for each hospital.
- Depending on the participant hospital’s quality and episode spending performance, the hospital may receive an additional payment from Medicare or be required to repay Medicare for a portion of the episode spending.
CJR – Specifics

• Hospitals are allowed to enter into financial relationships with collaborators in order to share risk and savings; as such, these collaborators are incentivized to increase quality and decrease cost
• Collaborators include Inpatient Rehabilitation Hospitals, SNF, Home Health, Long-Term Hospitals, physician group practices, and physicians and non-physician providers (i.e. physical therapists)

CJR – Specifics

• Required Quality Measures
  – NQF #1550 (complication rate)
  – HCAHPS Survey – HLMR (HCAHPS Linear Mean Roll-Up), which summarizes performance across 11 publicly reported HCAHPS measures
• Voluntary Quality Measures
  – Patient Reported Outcomes – pre-operative (90 to 0 days prior to the THA/TKA Procedure); post-operative (measured 275 to 365 days after the THA/TKA procedure)

CJR – Specifics

• Pre-operative PROs
  – Hospitals need to submit the VR-12 OR PROMIS-Global; AND
  – HOOS/KOOS Jr. OR HOOS/KOOS subscales; AND
  – Oswestry Index Question; AND
  – Data Collection Information; AND
  – Patient Demographics; AND
  – BMI, pre-operative use of narcotics, pain, literacy.
• Post-operative PROs
  – Same as above except last two sub-bullet points listed under pre-operative PROs

CJR – Specifics

• Quality Score
  – Complication measure: 50%
  – HCAHPS Survey Measure: 40%
  – Patient Reported Outcomes: 10%
• Reconciliation Payments
  – Payments that CMS will pay participating hospitals based on their expenses compared to their target price and a sufficient quality score (increases money paid back or decreases the amount

Physical Therapy Considerations

• Cost (based on CMS payment, not gross charges by the provider)
  – Measure
  – Track
• Quality
  – Use of PRO instruments for the CJR program
  – Evidence Based Practice
  – Standardize post-operative protocols through care re-design and collaboration with hospitals and physicians
Physical Therapy Considerations

• “Collaborator” Designation
  – In order to share in risk/reward with a hospital, a non-physician provider (physical therapist) “must enter into a sharing arrangement before care is furnished to CJR beneficiaries under the terms of the sharing arrangement.”
  – The total amount of a gain sharing payment for a calendar year paid to an individual physician or non-physician practitioner who is a CJR collaborator must not exceed 50 percent of the total Medicare approved amounts under the Physician Fee Schedule (PFS)

CJR – Proposed Changes

• Allow ACOs, hospitals, and CAHs to be CJR collaborators
• Eliminate the term “collaborator agreements” and replace with “sharing arrangements”
• Use the term “CJR activities” to identify activities that participant hospitals and their collaborators undertake to promote accountability for quality, cost, and overall care
• Consolidate requirements for access to records and retention and apply them more broadly.
• Changes to reconciliation and stop-loss/stop-gain

CJR – Proposed Changes

• Remove beneficiaries from CJR if part of a next generation ACO or ERSD
• Changes to use of quality measures and the composite quality score
• Ensure beneficiary notification
• No changes to the SNF 3 day waiver but added protection “to protect beneficiaries from financial liability in cases of misuse of the waiver.”
• Advanced APM participation
• Comment period ended October 2, 2016

Hip and Knee Joint Replacement: Indications, Technique, and Rehabilitation

Richard Illgen II, MD
Director of Joint Replacement Program
The University of Wisconsin
Department of Orthopedic Surgery

Hip DJD

• Pathophysiology of osteoarthritis of the hip
  – History
  – PE
  – Radiographic findings
• Contrast clinical findings:
  – Spinal stenosis
  – Hip DJD
  – Vascular claudication

SLIDE TRANSITION TO RICH ILLGEN, MD
Hip DJD

- Causes of Hip Arthritis
  - Developmental
    - Developmental dysplasia
    - Perthes Disease
    - Slipped Capital Femoral Epiphysis
    - Femoral-acetabular impingement (FAI)
  - Traumatic - dislocations, fractures
  - Infectious
  - Inflammatory (i.e., RA)
  - Idiopathic

Clinical Assessment

- History
  - Groin pain
  - Difficulty on stairs, tying shoes, clipping toe-nails
  - Limping common
  - Use of assist devices (i.e., cane)
  - Analgesics
  - Affects quality of life/activity level

Clinical Assessment

- PE
  - Restricted and painful hip ROM (especially IR)
  - Weak hip abductors
    - Muscle testing - Trendelenburg test
    - Gait assessment - Trendelenburg gait
  - Assess Limb length discrepancy

Internal Rotation

Trendelenburg Test

Trendelenburg Gait
Radiographic Assessment

- Classic X-ray findings
  - Loss of joint space
  - Osteophytes
  - Cysts
  - Sclerosis

Common Differential Diagnosis

- Back pain vs. Hip pain vs. Vascular problem
- Location of pain
  - Hip- groin
  - Back- low back/ buttock
  - Vascular claudication- calf
- Pain Radiation
  - Hip- rare- sometimes to the knee
  - Back- frequently radicular pain below the knee

Common Differential Diagnosis

- Hip pain- limp, difficulty tying shoes
- Back- better with back flexion (walking with grocery cart)
- Vascular- calf pain after specific distance walked, relieved with rest

Common Differential Diagnosis

- PE
  - Hip- restricted ROM and reproduces groin pain
  - Back- neurologic findings, positive SLR, restricted spine ROM
  - Vascular- abnormal pulses, loss of hair on legs
- X-rays- Hip and spine, A/P AND LAT
- When History, PE, and X-rays equivocal- hip anesthetic arthrogram
- If vascular cause suspected- ankle-brachial index -ABI

Treatment Hip OA

- Non-operative- NSAIDs, PT, weight reduction, activity modification, assist device
- Operative
  - Joint sparing
    - Osteotomy- OA
    - Core decompression- AVN
    - Hip Arthroscopy
  - Reconstructive procedures
    - THA
  - Salvage
    - Fusion
    - Resection arthroplasty

Principles and Limitations of THA
Changes in Patient Demographics and Expectations

- Traditional THA - Age > 65, low demand

THA

- Optimal treatment of hip DJD
  - Most frequently performed procedure for hip OA
  - 400,000/yr in U.S.
  - Used in young and old
  - Some limitations - wear, dislocation, need for revision in young patients

Complications

- Dislocation
- Limb Length Inequality
- DVT/PE
- Infection
- Fracture
- Bleeding
- Pneumonia
- Cardiac
THA: Limitations

Osteolysis: Bone loss

Loosening

Fracture

THA

- Safe reliable operation
- Improved quality of life for millions of patients over the last 40 years
- Cost-effective
- Limitations - Related to patient selection (obesity, co-morbid conditions) and surgical accuracy
  - Possible Role for Computer Guidance and Robotic Assistance

Rehabilitation

- Significant changes in last 10 years
  - Shorter length of hospital stay - often 1 day
  - Greater Percentage discharge home and avoid NH
  - Accelerated PT protocols
  - Shift to self directed recovery at earlier time points
  - Impact of Comprehensive Care for Joint Replacement (CJR) - bundled payment - 90 days of care

Technique:

- Anterior vs. Posterior Approach
- Robotic vs. Manual THA

Technique

- Anterior vs. Posterior Approach
  - Similar rate of recovery
  - Controversial differential rates of dislocation (1-4%)
  - Accelerated rehabilitation protocols affected by many variables
    - Patient age
    - Co-Morbidity
    - Pre-operative education and expectations
- Most important predictor of outcomes
  - Hospital and Surgeon Volume (experience)

Technique

- mTHA vs. rTHA
Manual THA Techniques: Inaccurate and Costly

- 400,000 Manual THA/ year in U.S.
- Dislocation:
  - Medicare patients - 4% dislocate within 2 years
  - Most common cause for early THA revision
  - Poor implant placement
    - Contributes significantly to dislocation risk
    - Directly under surgeon control

- Early dislocation increased cost by 350% - dePalma, et al., Hip International 2012
- Efforts to reduce dislocation rates would have significant advantages:
  - Patient: Quality of Life - Dislocation is a disabling problem and often requires additional surgery
  - Health care system: Dislocations are costly

Traditional mTHA

  - Acetabulum:
    - Outside target zone 50%
  - Femur:
    - Outside target zone 20-30%
- We can and should do better
  - Need more accurate and reproducible method than traditional techniques

Manual THA: MGH Experience

- Acetabular component
  - Inside target range:
    - High volume surgeons - 50%
    - Low volume surgeons - 35%
    - Worse with MIS and obesity

Better Execution: mTHA vs. rTHA

Robotic THA - Safe and Accurate Cup Reaming

- Visual Feedback
  - Green/White/Red
- Tactile Feedback
  - Haptic Stiffness (0.5mm)
- Audible Feedback
  - Beeping (0.5mm)
Robotic THA - Safe and Accurate Cup Impaction

Robot locks in trajectory to achieve accurate component position

rTHA: More Accurate and Reproducible Results

Virtual X-ray - Pre-op Plan
Recovery room real post op X-ray

• Summary page can be recorded in EMR

Evidence to support rTHA

• Accuracy: rTHA vs. mTHA

• Clinical Outcomes: rTHA vs. mTHA

rTHA vs mTHA: Single Surgeon Data

A Matched-Pair Study - Dr. Domb - CORR 2013

• rTHA (N=50) vs. mTHA (N=50), X-ray analysis (HAS)
• rTHA vs. mTHA: 100% vs. 80% in Lewinnek “Safe Zone”

rTHA vs. mTHA: Multicenter study

MGH, University of Wisconsin, HSS

mTHA vs. rTHA:
Single Surgeon - University of Wisconsin

• Fellowship trained arthroplasty surgeon (illgen)
  - N=300
  - 1st 100 mTHA in clinical practice (year 2000)
  - Last 100 mTHA performed prior to rTHA (year 2011)
  - 1st 100 consecutive rTHA (year 2012)
  - Follow up interval minimum 1 year

• Outcomes -
  - Radiographic: Acetabular component position
  - Clinical: Infection, OR time, EBL, Dislocation, LLD
  - PROM: SF-12, WOMAC, Knee Society Score, and UCLA Activity Scores

Conventional THA
Robotic assisted THA

- CTHA Cups Positions in Relation to Lewinnek’s and Callahan’s Safe Zone
- rTHA Cups Positions in Relation to Lewinnek’s and Callahan’s Safe Zone
UW rTHA study

rTHA vs. mTHA: Clinical Outcomes:
University of Wisconsin

<table>
<thead>
<tr>
<th>Cases</th>
<th>OR time</th>
<th>in &quot;safe zone&quot;</th>
<th>Dislocation</th>
<th>EBL (cc)</th>
<th>LLD&gt;15m (m)</th>
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<tr>
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<td>160 min</td>
<td>35%</td>
<td>5%</td>
<td>533</td>
<td>9%</td>
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<tr>
<td>Last manual 100 (2011)</td>
<td>129 min</td>
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<td>3%</td>
<td>437</td>
<td>1%</td>
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<tr>
<td>1st robotic 100 (2012)</td>
<td>143 min</td>
<td>76%</td>
<td>-</td>
<td>357</td>
<td>1%</td>
</tr>
</tbody>
</table>

mTHA vs rTHA: HHS

mTHA vs rTHA: UCLA at 1 year

Summary

- THA is a safe, reliable, and durable procedure for treatment of hip DJD that has not responded to non-operative care
- Rehabilitation protocols well established
  - Rate of recovery significantly improved in last 10 years
  - More patients directly home, fewer to NH
  - More changes coming with CJR (CMS)
- Recent innovations involving robotics- promising early results regarding accuracy and outcome

Evaluation and Management of Knee DJD
Unicompartmental Knee DJD

Overview
- Knee osteoarthritis
  - ~800,000 TKA annually
- Demanding patients
- High expectations

Prevalence
- Frequency of clinically relevant knee arthritis
  - 2% > 17 yo
  - 10% > 65 yo
  - F > M in older group
- Medial compartment 10X more common than lateral

Etiology of Arthritis
- Etiology of arthritis
  - Post-traumatic
  - Anatomic alignment
    - Varus
    - Valgus
  - Inflammatory
  - Idiopathic

Unicompartmental Arthritis
- Several Options exist
  - Non-operative
  - Joint Preservation
    - HTO
    - Arthroscopy
    - Biologics
  - Arthroplasty
    - Unicompartmental arthroplasty
    - Total knee arthroplasty

Conservative Care
- Initial treatment in all patients
  - NSAIDS
  - PT
  - Weight loss
  - Bracing
  - Steroids
  - Glucosamine chondroitin
  - Viscosupplementation
- Injections (steroid and viscosupplementation) not recommended by AAOS for routine treatment of knee DJD
Joint Preservation - HTO

- Select Patients
  - Young
  - Male
  - Laborer
  - Intact ligaments
  - Normal weight
  - Unicompartmental disease

HTO

- Advantages
  - Maintain high level activity
  - Can convert to TKA

- Disadvantages
  - Technically difficult
  - More difficult conversion to TKA
  - Limited durability

HTO

- HTO has poor survivorship
  - Study by Billings et al reviewed HTO and found 5 and 10 year survivorship 85% & 53% respectively
  - Conversion to TKA more difficult with results akin to revision surgery

- Acceptable procedure in select patient population

Arthroscopy

- Arthroscopy allows direct examination of joint
- Indicated when there is pain associated with mechanical symptoms
- Moseley did a study which suggested a placebo effect for arthroscopy of arthritis

Biologics

- Biologics at this time are more experimental than mainstream treatment
- OATS moves healthy cartilage from NWB region of knee to diseased weight bearing region
- Meniscal transplant

Arthroplasty

- Total knee arthroplasty is time tested procedure
- Good long term results
  - 94-98% success at 15 years documented in many studies
  - Somewhat poorer results reported in younger patients
Unicompartmental Knee Arthroplasty - UKA

- Indications
- Procedure
- Results

UKA - Indications

- Evolving and controversial topic
- Presently
  - Single compartment arthritis
  - Age:
    - <65: likely UKA is 1st of more than one operation
    - >65: UKA potentially last procedure
  - Ligamentous stability: ACL
  - No evidence of inflammatory arthritis
  - Near ideal body weight: avoid obesity
  - ROM: minimum 5-90 degrees with < 15 degrees deformity

UKA

- History
- Indications
- Procedure: Manual vs. Robotic

- rUKA compared with mUKA
- Robotic advantages:
  - More Accurate
  - Better outcomes
    - Lower revision rate at 3 years
    - Better validated PROM

Manual UKA

- Surgical accuracy utilizing visual alignment and guides

Manual Instrumentation: UKA

<table>
<thead>
<tr>
<th>Sometimes Good</th>
<th>Sometimes Bad</th>
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<tbody>
<tr>
<td>![Image 1]</td>
<td>![Image 2]</td>
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<tr>
<td>![Image 3]</td>
<td>![Image 4]</td>
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</table>
Poor Alignment: Result- Early Revision

Robotic Assisted UKA

- Better Planning: CT Based planning and guidance
- Better and safer execution
  - Robotic burr restricted to plan area

CT based pre-operative planning + Intra-operative guidance + Surgeon interactive Robotic Arm

rUKA: Lower revision rate compared with mUKA

Two Year Survivorship of Roboticity Guided Modular MCK Osteotomy
Principal Investigators: Chin, Reeho, Coon, Pearle, Dounchis

Methodology:

Result: REVISION RATES AT 2 YEARS

<table>
<thead>
<tr>
<th></th>
<th>Successful Cases</th>
<th>Failed Cases</th>
<th>Total</th>
<th>Failure Rates</th>
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</thead>
<tbody>
<tr>
<td>Manual UKA</td>
<td>120</td>
<td>5</td>
<td>125</td>
<td>4.0%</td>
</tr>
<tr>
<td>Robotic UKA</td>
<td>121</td>
<td>2</td>
<td>126</td>
<td>1.6%</td>
</tr>
</tbody>
</table>

UW data: rUKA lower Revision Rates

- Robotic UKA: Significantly Lower Revision rate than mUKA at 3.5 years (P<0.05)

UW data: PROM: UCLA Activity Score

- Manual UKA vs Robotic UKA
- R-UKA higher post operatively activity scores (p=0.035)

Summary

- rUKA compared with mUKA
  - Improved accuracy
  - Improved clinical outcomes
    - Reduced revision rates
    - Better patient reported outcomes
UKA vs. TKA

- Potential advantages UKA vs TKA
  - Less extensive surgical dissection
  - Less blood transfusion requirements
  - Fewer complications
  - Faster rehab
  - Greater motion - more normal feeling knee
  - Often easier revision when necessary
  - Patient satisfaction
  - Shorter hospitalization

Summary

- Many potential treatment options for patients with unicompartmental knee arthritis
- Conservative measures should be attempted first
- Patients stratify themselves into an overlapping array of treatment options based on clinical, radiographic and lifestyle differences
- UKA is a excellent treatment option for an evolving subset of these patients

Tricompartmental knee DJD

- Conservative management
- TKA

Tricompartmental knee DJD

- Significant prevalence
- 800,000 TKAs/ yr. in U.S.
- Related to obesity epidemic
- TKA - Very Durable Procedure
  - 5% failure rate at 10 years
  - 10% at 20 years
- However
  - Often long and involved rehabilitation
  - Variable satisfaction rates - 10-20% dissatisfied

TKA

- Causes for patient dissatisfaction after TKA
  - Stiffness
  - Persistent pain
  - Instability
  - Complications - infection, re-operation
  - Unrealistic expectations
  - Technical surgical errors
  - Psychological issues - pain tolerance, previous narcotic use, ETOH, depression and other psychologic co-morbidities

TKA

- Techniques and implants have evolved but outcomes changed very little in 40 years
- Survival rates good at 10-20 years in older patients but significant rates of dissatisfaction remain
- Failure rates higher in younger patients and satisfaction rates often lower
- Significant opportunity to improve survival and satisfaction after TKA
TKA

- Technique
  - CR vs. PS - no difference
  - Fixed or Mobile Bearings - no difference
  - Implant manufacturers - no significant differences despite marketing on internet
  - Currently only manual techniques available
- Robotic TKA
  - Recently FDA approved
  - UW - one of 10 centers worldwide to introduce this technology (November 2016)
  - Optimistic TKA will improve accuracy and outcome similar to rTHA and rUKA

Questions?

SLIDE TRANSITION TO TIFFANY HOUDEK, PT, OCS

Summarize the challenges and opportunities in the rehabilitation of patients with total joint replacement surgery across the continuum of care and the utilization of multiple models of care.

“Mary and Steve”
- Mary, a 77 year old female, has chronic bilateral knee pain
  - Pain has been worsening over the past 6 months
- Current management of chronic B knee pain
  - IBU, Tylenol, activity modification (does less) and aqua therapy at her local health club
- Referred by spouse (Steve) to Orthopedic surgeon
  - Steve had multiple joints replaced by same surgeon
  - Rheumatology agreed with referral
  - Surgeon deems TKA appropriate
    - Severe tricompartmental disease bilateral knees
      - PF joint R > L
      - Medial compartment L > R
      - Lateral compartment R > L
  - Mary to determine which knee is to be replaced first
    - Based on pain, lesser function, symptoms

Medications
- Acetaminophen
- Aspirin
- Atenolol
- Azelastine nasal spray
- Calcium plus D 2 tablets
- Voltaren topical gel 2 times
- Fluticasone inhaler
- Glucosamine/chondroitin
- Hydroxychloroquine
- Ipratropium nasal spray
- Multiple vitamin
- Systane eyedrops
- duloxetine
- Zinc as needed.

Past Medical/Surgical History
- H/o CVA, brain aneurism
  - s/p aneurism clipping
    - Poor progress at time of CVA
      - However has made remarkable recovery with sustained mild speech and memory impairment
- Hypertension
- Hyperlipidemia
- Obstructive Sleep Apnea (OSA)
- Undifferentiated connective tissue disease (Sjogren’s likely)

Summarize the challenges and opportunities in the rehabilitation of patients with total joint replacement surgery across the continuum of care and the utilization of multiple models of care.

• Steve has concerns about upcoming surgery due to patient’s stroke and how he is going to manage everything
  - Couple decides to wait and think about what to do next
• Mary and Steve decide to schedule surgery for the right knee, with surgery scheduled about 3 months after initial orthopedics consultation
• Mary and Steve, care team discussed possible discharge destination
  - Steve feels unable to care for Mary after surgery due to her stroke
    - Steve and Mary agree to SNF placement after surgery however Mary has hopes to go home with Home Health
• Mary and Steve did not attend Joint Class 101 as Mary is going to discharge to SNF
  - “They will take care of everything”
Challenges?

• List challenges with this patient case
  – Pre-surgery
  – Post surgery/ Inpatient Therapy
  – SNF
  – Home Health
  – Outpatient Therapy

Opportunities/Ideas for success

• List opportunities with this patient case
  – Pre-surgery
  – Post surgery/ Inpatient Therapy
  – SNF
  – Home Health
  – Outpatient Therapy

What does the research say?

• Sharareh et al (2014) found that persons that discharged to a SNF s/p TJA
  – had slower TUG
  – lower EQ-5D score
  – higher ASA scores
  – Increased length of stay
  – Increased reported postoperative pain
  – Decreased physical therapy achievements
  • Distance walked post operatively

Pre-operative Factors—discharge destination?

• Sharareh et al

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<th>P-value</th>
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<td>Living status (patient lives alone)</td>
<td>Yes: 14 No: 26</td>
<td>Yes: 5 No: 45</td>
<td>P = 0.04</td>
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<tr>
<td>TUG (seconds)</td>
<td>21.12 (+/- 10.23)</td>
<td>15.75 (+/- 6.76)</td>
<td>P &lt; 0.01</td>
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<tr>
<td>EQ-5E (0-100)</td>
<td>55.82 (+/- 22.19)</td>
<td>68.35 (+/- 18.02)</td>
<td>P &lt; 0.01</td>
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Post-operative Factors—discharge destination?

• Sharareh et al

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<tbody>
<tr>
<td>Distance walked POD1 (ft)</td>
<td>68.95 (+/- 76.12)</td>
<td>151.36 (+/- 121.56)</td>
<td>P &lt; 0.01</td>
</tr>
<tr>
<td>Distance walked POD2 (ft)</td>
<td>127.49 (+/- 113.13)</td>
<td>167.47 (+/- 118.73)</td>
<td>P &lt; 0.09</td>
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Post-operative-discharge destination?

• Sharareh et al

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<th></th>
<th>SNF</th>
<th>Home</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOS</td>
<td>2.68 (+/- 0.66, 2-4)</td>
<td>2.39 (+/- 0.60, 1-4)</td>
<td>P=0.02</td>
</tr>
<tr>
<td>VAS POD1</td>
<td>5.71 (+/- 2.46, 0-10)</td>
<td>4.48 (+/- 2.57, 0-10)</td>
<td>P=0.02</td>
</tr>
<tr>
<td>VAS POD2</td>
<td>4.77 (+/- 3.37, 0-10)</td>
<td>3.38 (+/- 2.77, 0-10)</td>
<td>P=0.03</td>
</tr>
</tbody>
</table>
Patient who lives alone—discharge destination?

- Sharareh et al

<table>
<thead>
<tr>
<th></th>
<th>Live alone discharged to SNF</th>
<th>Live alone discharge to home</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-operative EQ-5D score</td>
<td>59.00 (+/- 21.45)</td>
<td>68.35 (+/- 18.02)</td>
<td>P = 0.02</td>
</tr>
<tr>
<td>Distance walked on POD #1 (ft)</td>
<td>54.23 (+/- 73.92)</td>
<td>148.98 (+/- 118.92)</td>
<td>P &lt;0.01</td>
</tr>
</tbody>
</table>

What does the research say?

  - Healthy patients discharged to SNFs after primary total joint arthroplasty had higher odds of hospital readmission in 90 days of surgery than those discharged home
- Risks to patient
- Costs
- Patient satisfaction

Challenges and Opportunities

- Does anything change?
- Reflections on practice

Surgery Right TKA

- Pre-op appointment
  - Decrease in right knee ROM
  - Initial consult 3 months ago: 0-0-130 degrees
  - Pre-operative appointment: 0-5-110 degrees
  - Persistent right knee edema
  - Medically cleared for surgery
  - Scheduled 16 days later
  - Anticipated discharge plan: SNF
  - Anticipated LOS: 2-3 days

Surgery

- Surgeon’s note:
  - Severe end stage tricompartmental arthritis
  - released soft tissue restrictions medially
  - Extreme wear on the patella
- Surgery went well, no complications
- Pain well controlled upon transfer to inpatient unit

Challenges?

- Any new challenges identified here?
- Implications for the Inpatient Physical Therapist
Opportunities

• Any opportunities identified here?

• Implications for the Inpatient Physical Therapist

Things for the PT to consider

• Incisional healing (drainage)
• Soft tissue healing
• Edema management
• Expert consensus
• Balance, gait and safety
• Knee ROM
• Strength/Prevention (avoidance of atrophy)

POD #0 Physical Therapy visit

• Fall risk factors: post/op fatigue, pain, frail
• WBAT
• Standard falls precautions per nursing assessment
• Participation is impaired by pain
  • At rest 1/10 pain
  • With mobility and exercises 4/10 pain

Inpatient Physical Therapy Strategies

— PT uses multiple pain intervention techniques
  • Distraction
  • Mobilization
  • Education
  • Repositioning
— Result: improvement in tolerating therapy with improved function noted

Physical Exam POD#0, PT

• Range of Motion
  — Left LE: WFL
  — Right LE: ankle/hip grossly WFL
    • Right knee ROM: 0-17-38 degrees with assist
• Strength
  — Left LE: 5/5 Right ankle/foot/hip grossly 4/5
  — Right quad: fair to poor contraction

Physical Exam POD#0, PT

• Bed mobility
  — Assist needed, bed rails, HOB elevated
  — Supine ➔ Sit: Stand by assistance
  — Sit ➔ Supine: Minimal assistance
  — Scooting: supervision and set up
• Transfers
  — Sit ➔ stand: Minimal assistance
  — Stand ➔ sit: Minimal assistance (poor eccentric control)
  — Stand pivot transfer: stand by assistance
  — Device used for standing transfers: walker
Challenges?

Physical Exam POD#0, PT
Contemporary PT practice

- Locomotion
  - Ambulation Ability: contact guard assist
  - Ambulation Distance: 40 feet
  - Gait description:
    - minimal step length and cadence
    - poor right knee flexion throughout gait cycle
    - very limited hip extension
    - poor right stance tolerance
    - very limited right knee extension in supine and standing
  - Device used: front wheeled walker

Opportunities?

Challenges?

- Does this change
  - Plan of care?
  - Discharge destination?
  - Frequency of intervention?
  - ?

Opportunities?

What does the research say?

- Planned discharge to SNF appropriate (Gholson, et al)

- If walking distance can be improved by POD#1, might be able to discharge home instead
  - Clinical implications of home vs SNF
  - Support at home?
    - Is this situation similar to living alone?
Treatment plan POD #0

- Walk with nursing again tonight
  – to improve POD#1 walking distance
- Exercise program
  – Ankle pumps, quad and glute sets, heel slides, hip abduction
  – 10 repetitions, every 1-2 hours when awake
- Positioning recommendations
  – Patient had placed pillow under knee for comfort/pain control
  – Patient education for pillow under calf to promote complete knee extension

Physical Therapist Impression POD#0

- Secondary to acute stage of recovery s/p right TKA
  – Requires assist x 1 to mobilize
  – Decreased activity tolerance
  – Decreased functional mobility independence
  – Decreased strength
  – Decreased range of motion
- Requires additional time, verbal cues to complete mobility tasks.
- Safe to transfer in room/ambulate with nursing staff.
  - Recommend continued rehab in subacute setting to facilitate her eventual safe and functional return home with intermittent assist from family

Use of CPM s/p TKA

- Physician prescribed CPM for inpatient use and use at SNF
- 0-110 degrees, increasing range as tolerated by patient

Challenges?

What does the research say?

- Herbold et al (2014) regarding CPM use
  – Edema management vs ROM
  – Patient understanding and use
- Rapid Recovery Protocols (THA and TKA)
  – Pre-operative education
  – Peri-operative nutrition, vitamin and herbal medicine supplementation
  – Preemptive analgesia
  – Post-operative rehabilitation
- Significant decrease in
  – Length of stay
  – Lower rates of hospital re-admission

Opportunities?
What does the research say?

- **Chen et al (2012)**
  - Studied 136 patients TJA
  - Isolated PT intervention on POD #0 shortened hospital length of stay, regardless of intervention performed
  - POD #0 patients ambulated 62.9 feet on POD #1 (2nd PT session)

<table>
<thead>
<tr>
<th></th>
<th>POD #0</th>
<th>POD #1</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length of stay</td>
<td>2.81 days (+/- 0.77)</td>
<td>3.79 days (+/- 1.74)</td>
<td>0.019</td>
</tr>
<tr>
<td>Late operative end time</td>
<td>0 (0% of cases)</td>
<td>14 (12.6% of cases)</td>
<td>0.001</td>
</tr>
<tr>
<td>Distance ambulated 1st PT session</td>
<td>18.7 feet (+/- 1.74)</td>
<td>37.4 feet (+/- 1.74)</td>
<td>0.012</td>
</tr>
</tbody>
</table>

**POD #1**

- Mary used CPM overnight x 30-45 minutes for edema management
  - Ambulation distance:
    - 40 feet in AM, 21 feet in PM
  - Gait pattern unchanged, contact guard assist
  - No flexion stretches in AM due to increased incisional drainage
  - Steve unable to assist patient at home as he has impaired mobility (uses walker)
  - Mary needed additional time, effort and was laboring during PT on POD #1
    - Minimum assistance for Therapeutic Exercise
    - Multiple stairs to enter home
  - Discharge destination → SNF on POD #2

**SNF rehabilitation**

- 10 days (was anticipated to stay 14 days)
- Therapy focused on functional mobility
- Proximal hip strengthening
- Knee range of motion
- Patient requested early discharge to home

**Contemporary Treatment Practice**

- Group therapy
  - Wainright et al (2015) and Hiyama et al (2016) both found group therapy to be beneficial
    - Inpatient
    - SNF
    - Outpatient
    - No negative effects have been noted by research
    - Possible positive effect hypothesized
      - Less resource intensive
      - Use of PTAs in clinical setting
      - Encourages positive group psychology
      - Empowers patient’s to take control of rehabilitation process early with improved follow through on HEP
      - Group support system
      - Motivational tool

**POD #1**

- Participated in small group physical therapy on Inpatient unit
  - Aprile et al (2011)
  - Group inpatient PT is less resource intensive when used with a certain group of patients
    - WBAT status
    - THA and TKA

**POD #1**

- Discharge destination → SNF on POD #2
  - 10 days (was anticipated to stay 14 days)
  - Therapy focused on functional mobility
  - Proximal hip strengthening
  - Knee range of motion
  - Patient requested early discharge to home
Outpatient Consult visit #1

• G codes:
  – Mobility Walking and Moving Around
  – 40-59% impairment, goal 1-19% impairment
  – (PT assessment 55-59% disability)

• Pain: best 2/10, current 4/10, worst 6/10
  – Inconsistently taking pain medication
  – Using pillow under knee for comfort
  – Inconsistent HEP, prefers not to perform knee ROM exercises
  – Over-rated current functional status at 32% disability on Care Connections Functional Tool
    • For example: I can walk normally on uneven ground without loss of balance or using a cane or crutches
    • Observed by PT: significant balance impairment with required use of front wheeled walker and stand by assist
    • Dayton et al (2016) (THA population over-estimated physical function on self-reported outcome measure compared to demonstrated physical abilities)

Outpatient Consult visit #1

• Range of motion
<table>
<thead>
<tr>
<th>Flexion</th>
<th>Extension</th>
</tr>
</thead>
<tbody>
<tr>
<td>Involved</td>
<td>76 degrees</td>
</tr>
<tr>
<td>Uninvolved</td>
<td>125 degrees</td>
</tr>
</tbody>
</table>

• Hip and ankles bilateral: WFL
• Quad set: good quality, 20 degree extensor lag
• Contralateral strength deficits: WFL (4/5)

• Balance:
  – unable to perform on right (involved)
  – left 6 seconds with significant postural sway,
  – significant LOB, delayed reaction

Outpatient Consult visit #1

• Gait pattern
  – Antalgic, FWW
  – Decreased heel strike
  – Lack of TKE
  – Decreased stride length bilaterally
  – Decreased speed
  – Flexed trunk

Goals

• Short Term Goals: to be met in 4 weeks
  • She will be independent with home exercise program between visits to augment gains achieved in therapy
  • She will demonstrate knee AROM 0-120 degrees to allow for rising from sitting in a chair with use of the affected leg
  • She will safely demonstrate an increase in strength, decrease in pain, and increase in knee flexion AROM to be able to negotiate stairs reciprocally with a railing

  • Goals/Functional Outcomes: to be met in 8 weeks
    • She will demonstrate knee AROM 0-120 degrees to allow for rising from sitting in a chair with use of the affected leg
    • She will safely demonstrate an increase in strength, decrease in pain, and increase in knee flexion AROM to be able to negotiate stairs reciprocally with a railing
    • She will be able to ambulate community distances of 500 feet safely without assistive device and with normal gait pattern including use of full extension at heel strike (6MWT)
    • She will demonstrate decrease risk of falling on DGI to 20/24.
    • Climb 13 steps independently, return to her regular weekly bible study
    • Return to prior exercise activities using the PCE pool

Challenges and Opportunities

• Strategies to address challenges
• How do you make a challenge an opportunity to achieve patient and therapy goals?

Plan

• 8-12 visits over the next 8 weeks
  – Try to incorporate aquatic therapy as a treatment modality as this is her preferred exercise modality
  – Encourage self reflection to current physical impairments to address risk of falling
  – Encourage use of prescribed medication to improve tolerance to physical therapy
    • Follow up with surgeon
  – Consistent HEP for functional improvement
  – Patient control in ROM exercises
Contemporary treatment practice

- Use of aquatic therapy post joint replacement
  - Management of edema
  - Pain control for strengthening/stretching
  - Body weight supported gait training
  - Rahmann focused on hip abductor strength
  - Timing of aquatic therapy may be important
    - Liebs noted TKA group better early, THA better late

- Edema management
  - ROM restrictions and pain due to persistent edema
  - Activity modification with pacing
  - Kinesiotape vs. Tubigrip vs. TEDs vs Activity
    - Donec et al (2014) used Kinesiotape

What about prehabilitation?

- Challenges?
- Opportunities?
  - Patient education
  - Consistency
  - Patient Control
  - Patient goals

Current models

- Patient handouts
  - Learner
  - Reading level
  - Opportunity to ask questions?

- Meet with clinical staff prior to procedure
  - Often performed by nursing
  - May meet with PT, OT, RT, social work, etc
  - Unbilled time
  - Labor intensive
  - Performed in conjunction with pre-operative appointment
Current models

- Web based education
  - Videos
    - Videos from your facility
    - Videos from other sources
    - Video of your surgeon, rehab staff, nursing staff
  - Website information
    - Google search "total knee replacement"
    - Google search "total hip replacement"
    - Among many others

- Joint Class
  - Usually a combination of allied health care professionals who provide education and answers questions to a group of patients undergoing TKA, THA
  - Challenges?
  - Opportunities?

Prehabilitation Education

- What does the research say?
  - 1996 was the first that "pre-hospital education" is really addressed well in the literature
  - Butler et al. *Prehospital education: effectiveness with total hip replacement surgery patients*
    - Booklet and No-booklet groups
      - Booklet group
        - Less anxious at the time of hospital admission
        - More likely to have performed physiotherapy exercises
        - Less OT and PT in hospital
      - No group differences
        - LOS

  - Control group: usual care/advice and medical support
  - Experimental group: procedural, sensory, and coping information relating to THR + written information to support education
    - Information given pre-op, post-op and discharge
      - Positive effect on physical recovery and coping outcomes
        - Measured by "Physical Indicators of Coping Questionnaire"
        - Measured by "Linear Analogue Coping Scale"
      - Experimental group
        - Less post operation intramuscular analgesia
        - Mobilized sooner
        - Length of stay 2 days shorter than control group

Preoperative Education

- Remember this is 1996
  - Length of stay?
  - Patient Expectations ?
  - Health of patients?
  - Surgical procedures?
  - Complication rate?

- Cochrane review (2014)
  - To determine whether preoperative education in people undergoing total hip replacement or total knee replacement improves postoperative outcomes with respect to
    - pain
    - function
    - health-related quality of life
    - anxiety
    - length of hospital stay
    - incidence of adverse events (e.g. deep vein thrombosis).
Preoperative Education
- Cochrane review (2014) - 18 trials (1463 participants)
  - Although preoperative education is embedded in the consent process—
    - Unsure if it offers benefits over usual care
    - Reducing anxiety
    - Decreased pain
    - Improved function and
    - Reduced adverse events.
  - Preoperative education may represent a useful adjunct, with low risk of undesirable effects.
    - Particularly in certain patients,
    - Depression,
    - Anxiety,
    - Unrealistic expectations,
  - Preoperative education should be stratified according to their physical, psychological and social need.
- The question proposed is:
  - How many of your patients have a PMH of depression, anxiety and/or state unrealistic expectations?

Prehabilitation Exercise/PT
- Rooks et al. (2006) THA
  - 6-week pre-surgical exercise program
    - Can safely improve pre-operative function (not pain)
    - Safety improve muscle strength
    - Dramatically reduces odds of inpatient rehabilitation
- Topp et al. (2009) TKA
  - Usual care or prehabilitation group
    - Resistance training, flexibility, deep training
    - 3x/week
    - Improved to stand at one month after surgery
    - Better 6MWT than controls
- Swank et al. (2011) TKA
  - Short term (4-8 weeks)
    - Prehabilitation was effective
    - Increase in strength
    - Improver function
    - Severe knee OA
    - Program studied is easily transferred to a home program

Prehabilitation Exercise/PT
- Desmeules et al. (2013)
  - Canadian study
  - Long wait times until surgery
  - Even in the most severely compromised patients, a short course of prehabilitation education and individualized exercise improved physical function while awaiting TJA
    - Rationale: minimize functional deterioration while awaiting surgery and improve post operative recovery

Prehabilitation Exercise/PT
- Halawi et al. (2015) found that patient expectation is the most important predictor of Discharge Destination after primary TJA
  - 372 patients
  - Average LOS: 2.9 days
  - 29% discharged to extended care facility
  - Significant variables
    - Age
    - Caregiver support at home
    - Patient expectations (most important)
  - Take home message
    - Manage expectations
- Pilot study: Oosting et al. (2012)
  - Intensive preoperative training at home is feasible for frail elderly patients
  - Scheduled for THA
  - Improves function
  - Group differences noted pre-operatively on Chair Rise Test, however not statistically significant
  - Further research needed.
    - TUG, 6MWT, Chair Rise Time, self report measures of function, activity and participation
- Kamimura et al. (2014)
  - Pre-operative knee strength
  - Pre-operative hip abductor strength
  - Age
  - Predictive of ambulation ability early, middle, late time points after THA
    - 48 women in study
    - VAS
    - TUG
Prehabilitation Exercise/PT

- Snow et al. (2014)
  - The use of preoperative physical therapy was associated with a 29% decrease in the use of any post-acute care services
  - Association was sustained after adjusting for comorbidities, demographic characteristics, and procedural variables
  - THR and TKA patients
    - 4733 cases within 39 county Medicare hospital referral cluster
    - Post acute care was a significant variable in the total cost of care for the 90 day episode

- Wang et al. (2015)
  - Systematic Review
  - 22 studies (1492 patients), 18 had high risk of bias
  - Existing evidence suggests that prehabilitation may slightly improve
    - Early postoperative pain
    - Early function
  - “However, effects remain too small and short-term to be considered clinically-important”
  - What about discharge destination and overall cost of care in CJR model?
  - Did not affect key outcomes of interest
  - length of stay, quality of life, costs
  - Is there conflicting evidence, bias of researchers, poor study design, etc?

- Oosting et al. (2016)
  - Prospective cohort study, follow up of pilot study
  - Two functional performance based tests added significant value to conventional screening with age and comorbidities to predict recovery of functioning immediately after THA
    - Slow walking speed
    - TUG
    - Age, Charnley score of C
  - This is our realm
    - improving walking speed and TUG

Prehabilitation Exercise/PT

Prehabilitation Take Home Message

- Education
  - Education should be tailored to the patient
  - Best for patients with depression, anxiety or unrealistic expectations
  - Patient expectation for discharge is important and should be addressed before surgery

- Exercise or Physical Therapy
  - Evidence to support decreased cost with prehabilitation exercise
  - May benefit from tailoring exercise program to the patient
  - Focus should be to improve:
    - strength
    - TUG
    - walking speed
    - balance

Pre-operative Education

- Pre-operative appointment
- Nurse/SW screening prior to surgery
  - Needs assessment
- Joint Class 101
  - Allied Health Professionals
- TotalCare
- www.uwhealth.org/orthopedics
- Patient handouts
- Physical therapist and surgeon Q&A

Summarize the challenges and opportunities in the rehabilitation of patients with total joint replacement surgery across the continuum of care and the utilization of multiple models of care.

- “Lois”
  - 63 year old female, chronic multiple joint pain
  - Progressive hip pain over last 6 months
  - Significant DJD of the left hip
  - Recently retired clinical neuropsychologist
  - Referred to Orthopedics by Physical Therapist for continued pain despite PT intervention
What does the research say?

  - For early d/c after THR
    - Prepare patients for stressors related to THR
      - Review discharge process
      - Assessment and use of adaptive aids prior to surgery
      - Assessment of personal needs
      - Coping skills for the physical and mobility changes
      - Limited social interaction

What does research say?

- Stocken, et al. (2009)
  - Two time per day inpatient physical therapy is superior to once a day
    - Trend toward earlier achievement of functional milestones
    - No change in LOS

What does research say?

- Robbins et al (2014)
  - Retrospective analysis
    - Effect of POD #0 vs POD #1 physical therapy on LOS
      - POD # 0 physical therapy
        - 2.06 days (190 patients)
        - 96% discharged to home
        - 1 re-admission (0.52%) (0.52%)
      - POD #1 physical therapy
        - 3.38 days (400 patients)
        - 62% discharged to home
        - 19 re-admission (4.72%)

Inpatient

- POD #0
  - Ambulation distance: 200 feet
  - Device used: walker
  - Bed mobility: minimum assist
  - Transfer ability: moderate assist
  - Pain ratings: 4-6/10

- POD #1
  - Ambulation distance: 300 feet
  - Device used: crutches
  - Bed mobility: Independent
  - Transfer ability: Minimum assistance
  - Pain ratings: 3-5/10

Outpatient Consult Visit #1

- POD #3
- Current symptoms/concerns
  - Soreness/stiffness
  - Unsure of how to use crutches
  - Unsure of how to progress exercise
  - Stiffen up fast—is this normal?
  - How can I get my leg into/out of bed without aggravating my symptoms so much?
  - Pain 4/10 (cutting pain pill in half)

Outpatient Consult Visit #1

- Performing HEP 3x/day
- Using ice occasionally
- Review of Systems
  - fatigue but seems appropriate
  - just surprising to me
- Functional limitations
  - Care Connections score: 78% disability
- Patient goals
  - Return to activities without pain
    - tai chi exercise program, walking, hiking, traveling
  - Avoid worsening of chronic LBP, Neck pain
Outpatient Consult Visit #1

• Physical Examination
  – Bilateral axillary crutches
  • Decreased stride length, 4 point pattern
  – Incision: covered in dressing, no excessive drainage
  – ROM measured in degrees

<table>
<thead>
<tr>
<th>Hip PROM</th>
<th>Flexion</th>
<th>ER</th>
<th>IR</th>
<th>Abduction</th>
<th>Extension</th>
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<tbody>
<tr>
<td>Involved</td>
<td>80</td>
<td>40</td>
<td></td>
<td>15, 30 post treatment</td>
<td>0, 10 post treatment</td>
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<tr>
<td>Uninvolved</td>
<td>120</td>
<td>60</td>
<td>45</td>
<td>35</td>
<td>15</td>
</tr>
</tbody>
</table>

Outpatient Consult Visit #1

• Surgical Leg Strength
  – Quad set: good
  – SLR—deferred due to hip flexor irritability
  • Trained in hook with contralateral ankle for transfers
  • Review transfers for supine<->sit, sit<->stand
  – Gluteus medius: fair
  – Gluteus maximus: poor

• Contralateral strength deficits
  • G med, G max 4-/5
  • Quad/hamstrings 4/5
  • Ankle WNL

Outpatient Consult Visit #1

• Flexibility deficits
  – Left Adductors
  – Left hip flexors: one > two joint
  – Moderate restriction noted especially proximally
• Balance deferred
  – Able to walk with hand hold assist

What does the research say?

  – Subjects in high exercise compliance group showed significantly greater improvement
  • Muscle strength of operated hip
  • Fast walking speed
  • Functional score
  • 3x/week

• Trudelle-Jackson et al (2004)
  – Exercise program emphasizing weight bearing and postural stability
  • Significantly improved muscle strength, postural stability and self-perceived function in patient 4 to 12 months after surgery

• Smith et al (2008)
  – Addition of bed exercises does not significantly improve patient function or quality of life when added to standard gait re-education program

• Larsen et al (2010)
  – If HRQOL is used
    • additional PT for fast track THA is questionable when compared at 12 months
    • However, if 3 month is used pre- or early post-operative physical intervention should be considered

What does the research say?

• Galena et al (2008)
  – After initial instruction
    • Supervised center-based exercise group
      – 4.7 exercise sessions
    • 1 supervised sessions, 3.7 independent sessions
    • Unsupervised home-based exercise group
      – 5.8 times per week exercise sessions
    • No significant difference between exercise frequency between groups
    • Targeted strengthening was effective for both groups
      – No difference was found in the majority of outcome measures
What does the research say?

- Mikkelsen, et al. (2014)
  - Examine if 2 weekly sessions of PRT in combination with 5 weekly unsupervised home based exercise is more effective than 7 weekly unsupervised home based exercise after fast track THR
  - Variable: leg extension power of the operative leg
    - Measured at 10 weeks s/p THR
  - Secondary variables
    - Maximum walking speed
    - Hip abduction strength
    - Hip flexion strength
    - Sit to stand test
    - Stair climb test
  - Study design limitations and bias
  - Critical analysis of research

- Umpierres et al. (2014)
  - 106 patient THA
  - Assessed post operatively and at 15 days post-operatively
  - THA group: verbal instructions and exercise demonstrations
  - THAPCP: same with daily treatment guided by a Physical therapist
    - Higher strength force scores
    - Improved range of motion
    - Greater improvement in Merle-d’Aubigne and Postel score
    - Improved functional capacity
    - Improved ODL
    - Improved mobility
    - Improved strength
    - Improved pain
  - Conclusion: THAPCP safe tool for accelerating recovery s/p THA

  - Germany
  - Attempt to identify prescription standards among different rehabilitation professionals
    - Considerable differences noted
    - Physiotherapist and exercise physiologist tended to be more conservative
    - Surgeons recommended faster progression of WB, exercise prescription and gait

- Guideline Recommendations for post-acute Post-operative Physiotherapy in Total Hip and Knee Arthroplasty: Are They Used in Clinical Practice?
  - Dutch study
    - Response to survey
    - Billed services
    - Reconciliation of data

Patient outcome

- 5 visits to outpatient physical therapy
  - Completed in 5 weeks
  - Focused on strengthening
  - Balance and balance reactions
  - Neuromuscular re-education
  - Addressed questions, concerns, disability perception
  - Met all goals for return to prior level of function
  - Walked up 2 flights of stairs for 2 week post-operative follow up

Take home message

- Start therapy on POD #0
  - 2x/day therapy
  - Use of group therapy on IP and/or OP settings
- Prehabilitation may be beneficial
  - Focus on strengthening, TUG, balance, walking speed
  - Pain reduction is not the goal
- Pre-operative education may be beneficial
- Set expectations for surgery and discharge
- Set rehabilitation expectations prior to surgery
- Consider how a major surgery affects a patient’s mental health
  - What can we do as physical therapists?
- Outpatient care to address current limitations in gold standard for practice
  - TUG, gait speed, balance, strength deficits