

Functional Outcomes Following a TFN Hip Nailing for a Patient with Cognitive Impairment

Kjersten Skjold

Patient Introduction: History

- Patient is a retired 89 year old Caucasian male admitted to the TCU following a fall in his garage which resulted a left intertrochanteric hip fracture that was surgically repaired with trochanteric fixation nail (TFN) hip nailing.
- Two days s/p TFN the patient began experiencing increased confusion, became disoriented to time and place, demonstrated poor judgment and a had a decreased awareness of safety precautions.
- Currently, pain is being controlled with Oxycodone.

Patient Introduction: Diagnosis

- **Medical Diagnosis:** s/p L TFN
- **Physical therapy practice pattern:**
 - 4l: Impaired Joint Mobility, Motor Function, Muscle Performance, and Range of Motion Associated with Bony or Soft Tissue Surgery
- **ICD-9 code:** 820.21.
- **Prognosis:** Over the course of 1-8 months, the patient will demonstrate optimal joint mobility, motor function, muscle performance, ROM, and the highest level of functioning in home, work, community and leisure environments.

Trochanteric Fixation Nail



<http://www.mypacs.net/cases/62598359.html>



http://www.synthes.com/sites/intl/InvestorsMedia/MediaCorner/images/trauma/TFN_02.jpg

Patient Introduction: PLOF

- Lived independently with wife in a single level town house which is part of a senior living facility (SLF).
- Ambulated community distances independently without the use of AD.
- Drove independently.
- Hobbies/interests included yard work, social activities organized by SLF, religious activities and family gatherings.

Discharge Planning

- Return home to single level townhouse in SLF with wife.
- AD: FWW
- HEP
- Possibly increased assistance at SLF
- Home Health

Initial Contact

- Overall, the patient was admitted to TCU with decreased functional mobility and limited tolerance to functional activity.
- **Weight bearing Status:** LLE WBAT
- **ROM:** L hip AROM for flexion measured 65 degrees compared to R hip flexion of 94 degrees and L hip AROM for abduction measured 17 degrees compared to R hip abduction of 27 degrees.
- **MMT:** 1/5 for L hip flexion and 2/5 for hip abduction, compared to 4+/5 and 4/5 on the R hip respectively.
- **Pain:** 4/10 at rest and 7/10 with activity using the Visual Analogue Scale (VAS).

Initial Contact

- **Gait:** the patient required the use of a FWW MIAx1 to facilitate balance for a distance of 20 feet. He demonstrated an antalgic gait pattern, decreased step length on the left, and lacked heel strike on the LLE.
- **Timed Up and Go (TUG):** 38 seconds.
- **Bed mobility:** MOAx1 for scooting, rolling, and supine to/from sitting
- **Transfers:** MIAx1 using FWW for sit to/from stand transfers and stand pivot transfers from the w/c to/from EOB.
- **Primary Goal:** Return to home at PLOF.

Goal #1

- Within 4 weeks of PT intervention, the patient will ambulate a distance of at least 250' using FWW in order to return home and participate independently in vocational & leisure activities.

- **Audience:** patient
- **Behavior :** ambulate
- **Condition:** Following 4 weeks of PT intervention
- **Degree:** 250 feet, using FWW
- **Function:** return home, participate in vocational & leisure activities

Goal #1

- **Recording & Observing Behavior**
 - **Setting**
 - TCU facility
 - Level surfaces
 - **Method of Data Collection**
 - Distance measuring wheel
 - **Period of Time**
 - 2x daily for 4 weeks of PT intervention
 - **Observation & Recording Performance**
 - Quality of ambulation and distance of ambulation was recorded daily treatment note.
 - **Plot Data**
 - Weekly, data was recorded in chart based RehabCare's FOM scoring criteria
 - level of independence & distance.
 - Provided convenient method of determining progress.
 - **Continue**
 - Goal was achieved by discharge.
 - Encouraged patient to continue ambulating regularly with FWW.

Goal #2

- Within 1 week of PT intervention, the patient will demonstrate MIA with scooting, rolling and sit to/from supine in bed as a progression toward independence with bed mobility skills.

- **Audience:** patient
- **Behavior:** scooting, rolling and sit to/from supine in bed
- **Condition:** following 1 week of PT intervention
- **Degree:** MIA, in bed
- **Function:** bed mobility skills

Goal #2

- **Recording & Observing Behavior**
 - **Setting**
 - TCU bed in patient's room
 - **Method of Data Collection**
 - Recording the quality of skill.
 - Began with MOA and goal is MIA.
 - **Period of Time**
 - Reassess for appropriateness of goal and treatment following 1 week of PT intervention
 - **Observation & Recording of Performance**
 - Observed at start and finish of each treatment session.
 - Recorded quality of skill/mobility in daily treatment note.
 - **Record Data**
 - Overtime, data was recorded in table based on RehabCare's FOM scoring & criteria.
 - Provided convenient method of determining progress.
 - **Continue**
 - Following 1 week of PT intervention pt achieved goal
 - A goal appropriate for the pt ability was established

Values

Patient	Personal	Professional
Humor	Integrity	Sincerity
Connection	Compassion	Attentiveness
Flexibility	Determination	Communication
Initiative	Initiative	Timeliness
Compliance	Best Effort	Teachable
Independence	Motivation	Organization

Johari Window

	Know to Self (patient)	Unknown to Self (patient)
Known to Others (PT)	<u>Arena</u> Hip Fx TFN Hip nailing	<u>Blind Spot</u> Cognitive Impairment Diagnosis Prognosis Plan of Care Discharge Planning
Unknown to Others (PT)	<u>Façade</u> Understanding	<u>Unknown</u>

Force Field Analysis

Driving Forces

Family Support →

Positive Outlook →

Humor →

Financial Resources →

Access to Therapy →

Restraining Forces

← Pain

← Cognitive Impairment

← Complacent

← Pain meds

← HOH

Primary Long Term Goal: Return home to participate in work and leisure activities at PLOF.

Scientific Rigor: Evaluation

Discriminative Ability and Predictive Validity of the Timed Up and Go Test in Identifying Older People who Fall: Systematic Review and Meta-Analysis

Purpose

- To determine whether or not the Timed Up and Go (TUG) test is an appropriate tool to use in the clinic to identify the risk of falling in older individuals by examining the test's discriminative ability and predictive validity.
- Systematic review investigated the discriminative ability of the TUG test between fallers & non fallers in living in geriatric institutions and in the community and overall health and function.

Scientific Rigor: Evaluation

Conclusion

- Mean TUG times of fallers and non-fallers differ significantly
 - Small differences in healthy older individuals
 - Large differences in frailer less mobile individuals
- TUG is not useful for discriminating fallers from non-fallers in healthy & high functioning people, but is more useful in less healthy lower functioning groups.
- Cut points were so varied that it is not possible to make thresholds for the TUG to predict the risk of falling.
- Do not rely solely on the TUG in clinical practice to determine fall risk.

Application

- It would not be wise to use the TUG test to assess the risk of falling for this particular patient.
- TUG test can be used to evaluate other aspects of patients progress:
 - Gait speed and quality, use of assistive device, sit to stand, turning etc.

Quality of Life

- **Lower Extremity Functional Scale (LEFS)**

- ✓ Suitable for clinical purpose & setting
- ✓ Face validity (scientific common sense)
- ✓ Content Validation
- ✓ Formal Expression
 - ✓ Standardization
 - ✓ Content efficiency
 - ✓ Understandable directions and scoring
 - ✓ Scientific Rigor
 - ✓ Reliability:
 - ✓ Test-retest reliability was excellent ($R=.94$ [95% lower limit confidence interval(CI) =.89]).
 - ✓ Validity:
 - ✓ Correlation between the LEFS and the SF-36 physical function subscale and physical component score $r=.80$ (95% lower limit CI=.73) and $r=.64$ (95% lower limit CI=.54)
 - ✓ Normative Data:
 - ✓ minimal detectable change = 9 scale points (90% CI)
 - ✓ minimal clinically important difference = 9 scale points (90% CI).
 - ✓ Sensitivity to change:
 - ✓ superior to SF-36
- ✓ Practicality
 - Minimal time , equipment and stress/emotions

Clinical Decision Making

- **Accepting the Patient:**

- Referred
- Age
- Able to benefit from PT
- Reimbursement: Med A
- Independent PLOF
- Knowledge & skillset -- CI
- Equipment & resources
- No comorbidities

- **Direct Components:**

- Decrease L Hip ROM
- Decreased L Hip Strength
- Pain
- Impaired gait (quality & speed)
- WB status
- Assistance with ADL's
- Decreased bed mobility
- Assistance needed with transfers
- Decreased ambulation distance

Clinical Decision Making

• Indirect Components:

- Cognitive Deficits
 - Simple instructions
 - Provide extra time
 - Provide visuals
 - Consult family for hx
- HOH (L)
 - Speak clearly to him on his R
 - Pronunciate
 - Don't yell!

• Referral:

- Cognitive Deficits
 - Speech Therapy
- ADL's & UE strength
 - Occupational Therapy

Clinical Decision Making Model

- **HOAC**

- Examination of the patient generated a clear problem list.
- Patient identified personal goals right away.
- Specific criteria was set to determine progress.
 - Hip Strength, hip ROM, ambulation distance, pain, bed mobility, transfers, TUG
- Developed a POC to address each problem
- Reevaluated on a weekly basis to determine if pt goals were being met.
- Discharged to safe environment upon achievement of goals.

- **Wolf**

- Addresses cognitive status

Disease Taxonomy: Nagi Scheme

Pathology	Impairment	Functional Limitations	Disability
Hip fracture	L Hip ROM	Bed mobility	Limited social/family activities
TFN hip nailing	L Hip Strength	Transfers	Unable to drive
	Pain	Impaired gait (quality & speed)	No religious activities
	WB status	Assistance with ADL's	Unable to do yardwork
	Decreased cognitive abilities	Decreased ambulation distance	

Interventions

- Signed Informed Consent, HIPPA & DNR upon admission
- Skilled PT included therapeutic exercise, gait training and therapeutic activity.
- The patient was seen 2x/day for 35-45 min 6 days/week.

Interventions : Therapeutic Exercise

- **Supine protocol for L hip fx**

- Ankle pumps
- SAQs
- Heel slides on sliding board
- Hip abduction on sliding board
- Quad sets
- Hamstring sets
- Glut sets
- SLRs
- **Sets:** 1-2x/session
- **Reps:** 10-15x

- **Seated LLE strengthening**

- Hip flexion
- Isometric hip abd/add
- LAQs
- Hamstring curls
- **Sets:** 1-2x/session
- **Reps:** 10-15x

Scientific Rigor: Intervention

Mobility Training After Hip Fracture: a Randomized Controlled Trial

Purpose

- To determine if there are better functional outcomes with a HIGH dose weight bearing rehabilitation program compared to a LOW dose non weight bearing rehabilitation program in the inpatient rehabilitation setting.

Scientific Rigor: Intervention

Results

- Those with cognitive impairment that were assigned to the HIGH group had better outcomes on a number of variables including, walking speed, PPME, Barthel Index, Max Balance Range test, Step test, coordinated stability test, modified falls efficacy scale, EQ 5D, use of a walking aid, and pain.
- Lower overall exercise rate (-16% difference, 95% CI -24- -8%, $P < .001$)
- Greater exercise rate in HIGH group (14% difference, 95% CI= -2%-31%, $P = .096$)

Scientific Rigor: Intervention

Conclusion

- The study illustrated that there was no significant benefit for higher dose physical therapy for patients following a hip fracture.
- Cognitively impaired subjects saw greater benefits with a high dose physical therapy protocol compared to a low dose physical therapy protocol.

Application

- According to this study, this patient would have benefited more from a high dose weight bearing therapeutic exercise program due to his cognitive impairment.

Interventions: Gait Training

- **Ambulation on level surfaces**

- up to 350'
- FWW
- MIAx1 – MOD I with FWW.
- Focus was on
 - Reciprocal steps with equal step length
 - Increase weight bearing on LLE
 - Promote LLE heel strike
 - Increase ambulation distance

- **Gait training on stairs**

- Ascending/descending 3- 6” steps and 4- 4” steps
- Handrails (B) and a step-to gait pattern.
- The pt was instructed to ascend with the non-operative leg first and descend with the operative leg first.

- Verbal cues, tactile cues and demonstration were used to correct pt's impaired gait

Interventions: Therapeutic Activity

- **Bed Mobility**

- Bridging
- Scooting
- Supine to/from sit
- Purpose: decrease the amount of assistance with LLE during bed mobility activities & facilitate independence with bed mobility.

- **Transfer Training**

- Sit to/from stand with FWW from various surfaces (toilet, chair, bed & mat).
- Stand Pivot Transfers using FWW from w/c to EOB
- Purpose: facilitate independence with transfers

Patient Education

- **HEP - Standard hip fx protocol**
 - Hip flexion, extension, abduction
 - Knee flexion
 - Mini squats, calf raises
- **Safety & Fall Prevention**
 - Home Health Evaluation
 - Remove rugs
 - Clear clutter (extension cords, piles etc)
 - Turn on a light and use AD at night time.
 - Keep AD near by.
- **Ascend/descending stairs**
 - Ascend with non-operative first
 - Descend with operative first

Patient Education: Considerations

- **Learning Style**

- Concrete-experimental

- **Instructional aids**

- Pictures
- Simple directions
- Demonstration

- **Barriers**

- Cognitive impairment
- HOH

- **Documentation**

- Documented in progress note and daily notes

- **Culture**

- Same culture
- Same primary language

- **Cost Benefit Analysis**

- Education was completed during treatment.
- No extra charge.

- **Life Span**

- Different generations

- **T&L process/methods**

- Verbally explain task
- Show picture
- Demonstrate task
- Ask if he had questions
- Pt would demonstrate task
- Provide feedback as necessary

- **T&L Evaluation**

- Patient demonstrated task same day.
- Patient carried info/demo over next day.
- Answer simple questions about task during other aspects of treatment.

Patient Education

- **Domains of Learning**

- HEP- Cognitive, Psychomotor & Affective
 - Pt demonstrated carry over of task from day to day
 - Pt asked questions regarding exercises
 - Pt remarked, “I could do these even after my hip is better.”
- Fall Prevention-None
 - Pt would not use FWW for ambulation unless he was cued.
 - Difficult time remembering items to make ambulation safer when asked.
 - Primarily, the wife caught on to this topic and operated in the cognitive, psychomotor & affective domain.
- Stairs- None
 - Did not demonstrate carry over.
 - Could not remember sequence.
 - Needed excessive cueing to perform correctly.
 - Retaught same skill multiple times in different ways.

Patient Education

- **Levels of Learning**

- HEP- Knowledge & Application
 - Could demonstrate exercises correctly with visual aid
- Fall Prevention- None
 - Without cueing, pt could not recall practical ways to prevent falls.
 - Pt did not apply them to daily life unless given verbal cues.
- Stairs- None
 - Without excessive cueing, pt was unable to perform correct gait pattern on stairs even with multiple teaching & learning opportunities.
 - No carry over- no learning

Patient Education

- **Strengths**

- Used multiple strategies
 - Visual
 - Demonstration
 - Active participation
- Simplification of instructions
- Pt was attentive
- Willingness to learn
- Compliant

- **Weaknesses**

- Pt would voice more understanding than he really had.
- Novice SPT
- Limited experience teaching

Evidence Based Practice

“Extended Exercise Rehabilitation after hip fracture improves patients’ physical function: A systematic review and meta-analysis.”

Purpose

- To determine the effectiveness of extended exercise rehabilitation programs following a hip fracture in community dwelling patients.
- Compared no extended exercise rehabilitation, home based extended exercise rehabilitation, and community based extended exercise rehabilitation.

Evidence Based Practice

Conclusion

- This review supports the hypothesis that extended exercise program has a positive effect on physical function regardless of the setting; however, community based groups had greater effects than home based groups.

Application

- Group therapy at an outpatient clinic would have been the best and most ideal choice for extended exercise following sub acute rehab for this particular patient. However, there were a few barriers (unable to drive, cognitive impairment, & distance to nearest OP clinic) that influenced the decision to refer him to home health.

Outcomes

- **Overall**

- LOS was 24 days
- Pt met all functional mobility goals
- Pt continued to have decreased L hip strength

- **Discharge**

- Pt was provided with a front wheeled walker
- Pt received information regarding environmental hazards that increase the risk of falls and home.
- Pt received instruction regarding HEP.
- Home Health PT
 - Home Evaluation
 - Cont. left hip rehabilitation program.
- Pt did not required increased assistance at SLF

Cost/Benefit Analysis: Medicare A

- **RUG Levels**

70 min PT/day

X 6 days/week

420 min/week

- **High RUG Level**

- Per diem rate : \$333.34

X 24 days

- **Total:** \$8000.16

- Minimal Out of Pocket Expenses

Cost/Benefit Analysis: Fee For Service

Code	Treatment	Medicare Reimbursement (60%)	# of units	Total
97001	PT Evaluation	\$75.11	1	\$75.11
97110	Therapeutic Exercise	\$32.07	40	\$1282.80
97530	Therapeutic Activity	\$34.94	40	\$1397.60
97116	Gait Training	\$28.49	20	\$569.80
			TOTAL Med A	\$3325.31 (\$1995.19)

Number of visits: 20

Average Cost Per Visit: \$162.51 (\$97.50)

Cost/Benefit Analysis: Outcomes

Impairment or Functional Limitation	Admission	Discharge
L Hip Flexion AROM	65 degrees	87 degrees
L Hip Abduction AROM	17 degrees	24 degrees
L Hip Flexion Strength	1/5	2/5
L Hip Abduction Strength	2/5	2/5
Pain	7/10 with activity	2/10 with activity
Quality of Gait	MIA x 1 FWW	MOD I FWW
Ambulation Distance	40 feet	350 feet
TUG	38 seconds	28 seconds
Bed Mobility	MOA x 1	MOD I
Sit to Stand Transfers	MIA x 1 FWW	MOD I FWW
Stand Pivot Transfers	MIA x 1 FWW	MOD I FWW

Cost/Benefit Analysis: Outcomes

• Support Services

- FWW
 - \$73.00
 - Covered by Medicare
- Home Health
 - Home Evaluation
 - Weekly visits
 - approx. \$160/visit
- Wife assumed role of driver

• Participation

- Able to attend church
- Participate in family gatherings
- Participate in SLF social activities
- Not quite ready for yard work
- No longer driving

- Based on patients PLOF and previous participation in activities, he could remain a productive member of society at his CLOF following discharge.

Cost/Benefit Analysis: Quality

- **Rapport**

- Documenting while treating patient.
- Pt did not have undivided attention.
- Long rest periods.

- **Treatment**

- Quality
- Evidence Based

- **Copayment**

- Yes, I would have paid a portion.

- **Total Bill**

- Yes; if split into manageable payments.

Ethical Issues

- **RUG Level Selection**

- Treating patient at inappropriate level.
- Typically higher than what the patient is capable of participating in.
- More reimbursement at higher RUG level.

- **Possible Solutions**

- Treat patient at appropriate RUG level that fits the needs and abilities of the patient.
- Treat patient at higher RUG level than in appropriate and increase reimbursement for the facility.

Ethical Issues

- **APTA code of Ethics**
 - **Principle 7**
 - “Physical Therapists shall promote organizational behaviors and business practices that benefit patients/clients and society”
 - **Core Values: Integrity, Accountability**
 - 7E: “Physical therapists shall be aware of charges and shall ensure that documentation and coding for physical therapy services accurately reflect the nature and extent of the services provided.”

Ethical Issues

- **APTA code of Ethics**
 - **Principle 8**
 - “Physical therapists shall participate in efforts to meet the health needs of people locally, nationally and globally. “
 - **Core Value: Social Responsibility**
 - 8C: “Physical therapists shall be responsible stewards of health care resources and shall avoid overutilization or underutilization of physical therapy services.”

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