Increasing Physical Activity in Post Liver Transplant Patients

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Background

- Quality of life (QOL) improves after liver transplant (LT) but inferior to general population
- Liver transplant patients often debilitated, muscle wasted, deconditioned
- After transplant, immunosuppresive agents like Prednisone contribute to weight gain

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Background

- Survival rates 80%-90%
- QOL a key focus
- Exercise in chronic diseases → Higher QOL
- Exercise in liver transplant → Higher QOL

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Clinical Problem

- Physical Therapy: Transfers & Ambulation
- Discharged in as little as 4-5 days
- Nonspecific Discharge Activity Instructions
- Lack of Accountability
- Walking Rx and Daily Activity Log

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Purpose of the Project

- Assess & Apply Evidence
- Physical Activity Recommendations
- Evaluate the Results
- To increase physical activity among adult liver transplant patients to improve their quality of life (QOL).

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PICO Question

- Do adult liver transplant patients (P) who engage in regular physical activity (I) as compared to their sedentary counterparts (C) enjoy a higher quality of life (O)?

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Search Strategy

- 1,379 Studies
- Search Terms: Liver Transplant, Quality of Life, Exercise, Physical Activity
- Databases: CINAHL, Cochrane Library, Academic Search Complete, Science Direct, and Medline-Proquest.

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Search Strategy

- Included: PICO question, English, 2000-2014
- Excluded: Wrong patient population, research only on QOL or only on physical activity, and lower level studies.
- Seminal Studies

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Literature Review

- Seven studies: One RTC, one non-randomized interventional pre-post study, two case-control, and three cross-sectional
- Purpose: Physical Activity & QOL in LT patients
- 3 in Netherlands, 2 in US, 1 in Poland, 1 in Italy

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Literature Review

- Total Sample Size: 539 patients (*n*=16-180)
- Length of time since transplant: 2 mos-17 yrs
- Transplant patients share commonalities
- SF-36 or RAND-36 to measure QOL
- Measurement of Physical Activity:
  - Direct Observation
  - Patient Report

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Studies by Level of Evidence

Level of evidence	# of Studies	Study
II – RTC	1	Krasnoff et al. (2006)
III – Non-randomized Experimental Study	1	van Ginneken et al. (2010)
IV – Case-Control	2	Masala et al. (2012) van den Berg-Emons (2006b)
IV – Cross-sectional	3	Painter et al. (2001) Rongies et al. (2011) van Ginneken et al. (2007)

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SF-36/RAND-36

- Four Physical Scales:
  - Physical Functioning
  - Role-Physical
  - Bodily Pain
  - General Health
- Four Mental Scales:
  - Vitality
  - Social Functioning
  - Role-Emotional
  - Mental Health
- Physical Composite & Mental Composite

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Synthesis of Findings

- All found significant improvement in ≥2 scales
- 4/7 studies w/ signif improvement in ≥4 scales
- 6/7 studies w/ signif. improvement on the Physical Functioning (PF) scale (10/36 questions)
- 4/7 studies w/ signif. Improvement in the General Health (GH) scale (5/36 questions)
- PF scale most weighted; GH 2nd most weighted

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QOL Improvement per Scale

Significant Improvement in QOL per scale of the SF-36/RAND-36 for each study

SF-36/RAND-36 Scales	***Krasnoff et al. (2006)*** **(Level II)**	***Masala et al.*** ***(2012)*** **(Level III)**	*Painter et al. (2001)* (Level IV)	*Rongies et al. (2011)* (Level IV)	*van den Berg-Emons et al. (2006)* (Level IV)	*van Ginneken et al. (2007)* (Level IV)	***vanGinneken et al. (2010)*** **(Level III)**
Physical Functioning		X	X	X	X	X	X
Role – Physical		X	X				
Bodily Pain		X	X	X		X	
General Health	X	X	X	X			
Vitality		X	X			X	X
Social Functioning		X		X		X	
Role – Emotional		X		X	X		
Mental Health	X	X			X		
Physical Composite		X	X	X			
Mental Composite		X		X			

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Implications of the Evidence

- Consistent findings
- Regular physical activity → higher QOL with supervised and home-based programs

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Project Purpose, Setting & Design

- Purpose: Increase physical activity among post-op adult LT patients, improve documentation of daily activity, and ultimately influence QOL
- Clinical Setting: Mayo Clinic, Jacksonville
- Study Design: Single-subject, with every participant serving as his or her own control

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Population

- Population: Adult Liver Transplant recipients who are between 5 and 21 days post surgery
- Exclusion criteria were as follows: patients with active infections, with encephalopathy, with severe debility or who require assistance to ambulate

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Procedure

- Details of project explained to potential candidates
- Participation completely voluntary
- Written informed consent

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Procedure

- Benefits of engaging in regular activity
- 5 A's Behavior Change Model
  - Assess
  - Advise
  - Agree
  - Assist
  - Arrange

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Procedure

- *Assess* level of physical activity & QOL
  - International Physical Activity Questionnaire (IPAQ)
  - QOL on scale of 1-10
- IPAQ
  - 7 items to calculate MET score
  - Minutes & days spent during prior week in vigorous activity, moderate activity & walking
  - *MET= 8*VA(d*min) + 4*MA(d*min) + 3.3W(d*min)*

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Procedure

- *Advise & Agree* to engage in physical activity:
  - *Walk 5-10 minutes each day. Increase your walking by 5 minutes every 3 days. Your goal is to reach 30 minutes of walking for at least 5 days per week.*
- *Assist* patient to incorporate walking program
  - Activity Log
- *Arrange* for follow-up

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Procedure

- IPAQ and QOL question at 6 weeks & 4 months
- Activity log at 6 weeks & 4 months
- De-identified data

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Data Collection

- Demographic information
- Length of hospital stay
- Indication for transplant
- Comorbidities
- ICU stay required?
- MELD score
- IPAQ & QOL scores at baseline, 6w & 4m
- Activity Logs to explore patterns

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Data Analysis

- JMP Pro version 9.0.1
- Descriptive stats
- Wilcoxon Matched-Pairs Signed Ranks

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Protection of Human Subjects

- Mayo IRB #13-004699
- UNF IRB agreement with Mayo

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Results

- **12 participants initially enrolled**:
  - Eight (2 women & 6 men) completed thru 6 weeks and six (1 woman & 5 men) completed thru 4 mos.
  - Avg age of 60
  - All within 7 days post LT
  - Indications: HCV, Caroli's, fatty liver, alcohol, cholangiocarcinoma, HCC
  - MELD avg 25
  - Comorbidities: HTN, Kidney Disease
  - 3 required ICU stay
  - LOS avg 7 days

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Results: Physical Activity

- IPAQ MET median scores:
  - * Baseline 407.5
  - * 6 weeks 1711.5
  - * 4 months 1935.75
- Wilcoxon Signed-Rank test: No signif change in median MET; however, median MET scores increased as a whole by >400%

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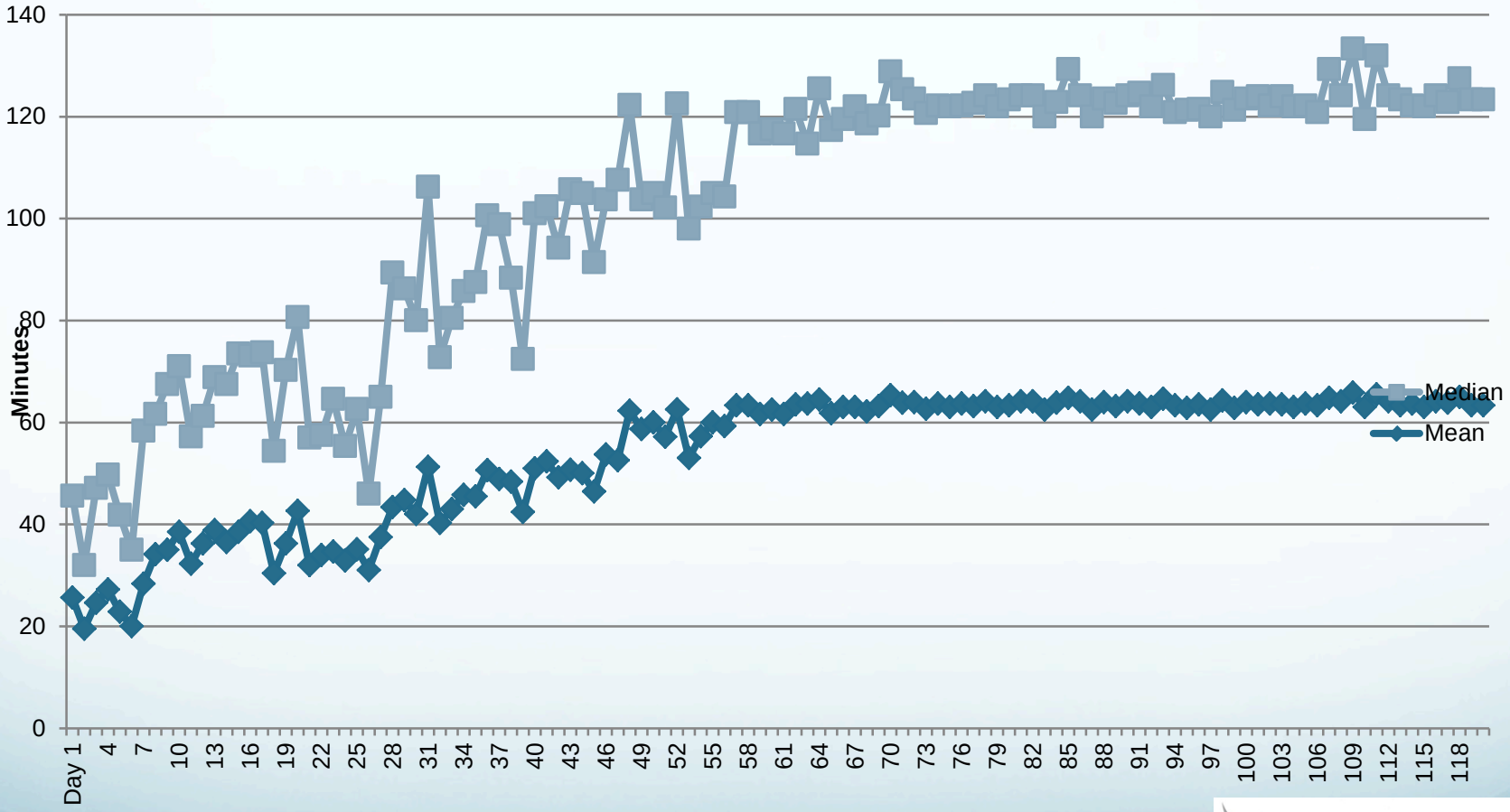
Minutes of Walking over 4 months



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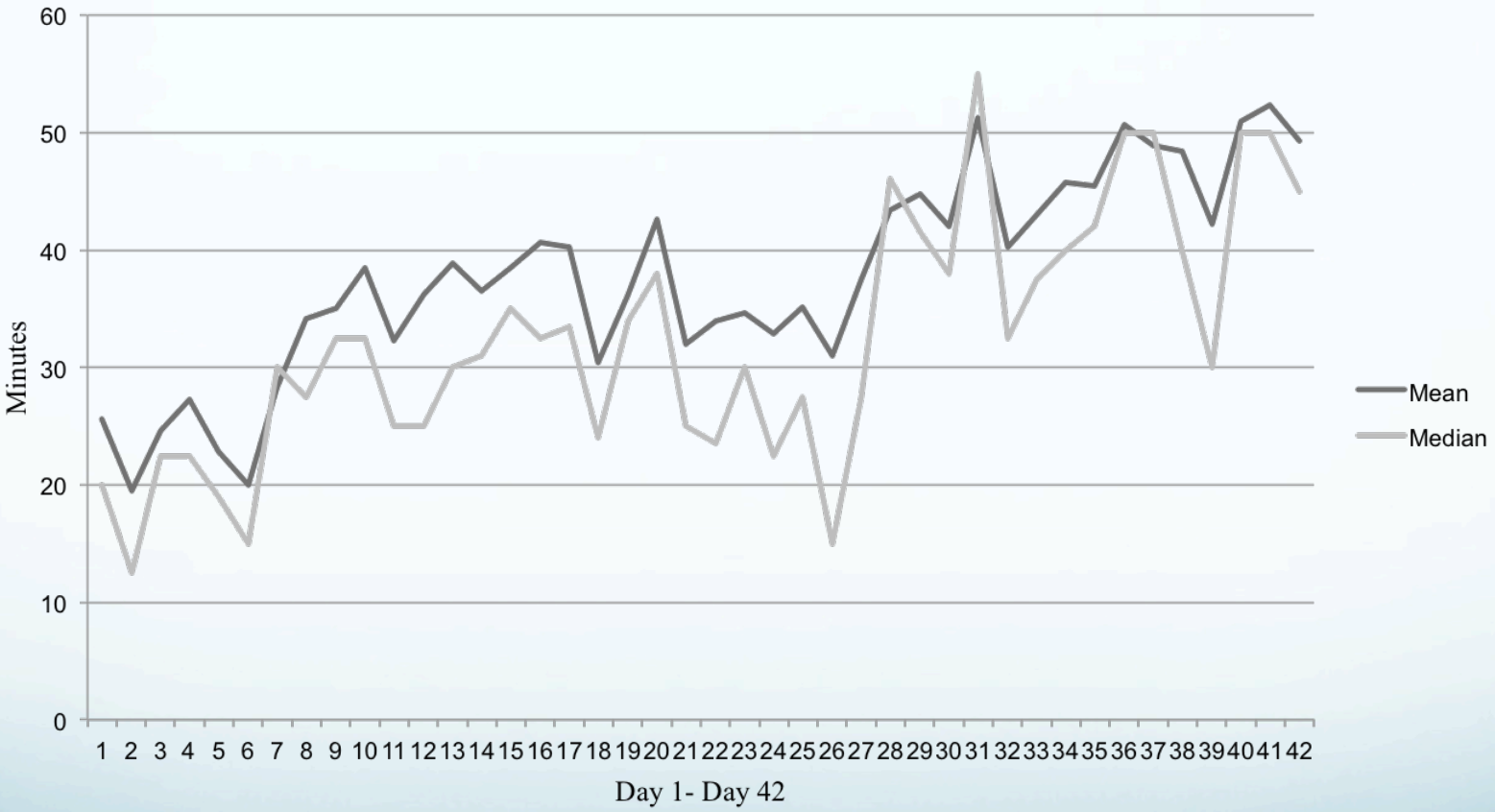
Minutes of Daily Physical Activity over Six Weeks



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Results: QOL

- QOL score at BL 5.5
- QOL score at 6 weeks 8.25
- QOL score at 4 months 8.3
- Wilcoxon Signed Ranks test: Significant improvement in mean QOL score (p=.027)

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Discussion

- Physical Activity increased
- Patients mobilized to act
- QOL improved

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Discussion

- Timing of Walking Program
- Early ambulation → fewer complications
- Close follow-up
- Real-time feedback

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Discussion

- Strengths and Limitations
- Pilot project
- Evidence-based practice
- 83% recorded their walking part of the 6 weeks, 66.6% recorded walking for 6 weeks, and 50% recorded walking for 4 months

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Conclusions

"With extensive resources (that is, professional, technical, financial, and emotional) utilized to bring each liver transplant into fruition, clinicians must commit themselves to optimizing each patient's QOL and clinical outcomes."

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