

The Integration of Rehabilitation into Primary Health Care for Adults with Chronic Illnesses: A Randomized Controlled Trial

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Funded by MOHLTC Primary Health Care Transition Fund



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Background

- RCT: comprehensive geriatric assessment in primary care including PT improved physical functioning, improved energy scale (Reuben et 1999)
- RCT: group visits for chronically ill HMO members included PT decreased health care utilization for intervention group (Beck 1997)
- RCT: comparing effectiveness of Cooperative Health Care Clinic for Chronically Ill HMO patients with usual care- no difference in health status or ADL but fewer hospital admissions, emergency visits, higher satisfaction, and better quality of life (Scott 2004)
- Persons with chronic disease generally do not have coverage to receive rehabilitation services unless provided within team approach in primary care

Overall Study Objective

To assess the effectiveness and cost of a demonstration project which introduced rehabilitation into primary care for chronically ill adults.

Primary Objectives

To determine whether adults with a chronic illness receiving care in a PC setting

1. show greater improvement in **health status**
2. have fewer **hospital admissions and emergency room visits**

as a result of a rehabilitation intervention compared with adults in the PC setting who do not receive the intervention.

Secondary Objectives

To determine whether adults with a chronic illness receiving care in a PC setting show:

1. improved **physical functional status, activities of daily living, instrumental activities of daily living, participation and decreased falls and injuries**
2. improved **self efficacy, increased knowledge of health behaviour, improved impairment measures (strength) and increased home safety**

as a result of a rehabilitation intervention compared with adults in the PC setting who do not receive the intervention.

Secondary Objectives

To determine whether adults with a chronic illness receiving care in a PC setting delivering care in the PC setting experience **greater satisfaction** as a result of a rehabilitation intervention compared with adults in the PC setting who do not receive the intervention.

Outcome Measures

- SF-36
- Emergency room visits
- Planned days in hospital
- Late life function and disability index (LLFDI)
- Self-reported falls
- Grip strength (Jaymar)
- 2 minute walk test
- Lower extremity function test
- Home Hazards
- Self-management
- Self-efficacy
- Patient Satisfaction Questionnaire (PSQ-18)

Design

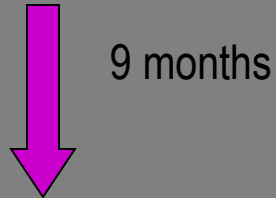
- Randomized Controlled Trial (stratified age and function)
 - Intervention group: Rehabilitation in primary health care
 - Control group: Usual care
- Setting: Stonechurch Family Health Centre
 - Study participants sampled from a single team (A) in the practice.
- Blind Assessments
 - Outcome assessments administered at three points

Sample Eligibility

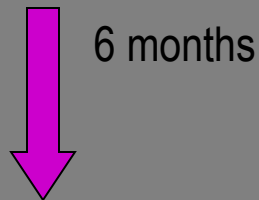
- Persons ≥ 44 years
- At least one of the following chronic conditions:
 - back pain
 - depression
 - chronic pain
 - COPD
 - diabetes
 - emphysema
 - multiple sclerosis
 - osteoporosis
 - stroke
 - falls
 - Parkinson's disease
 - fibromyalgia
 - cardiovascular disease (CHF, hypertension)
 - arthritis (rheumatoid, osteoarthritis)
- ≥ 4 visits to the practice in the 12 months prior to recruitment
- Neither had dementia nor residing in a long-term care facility

Timelines

Time 1 Assessments
July-December 2004



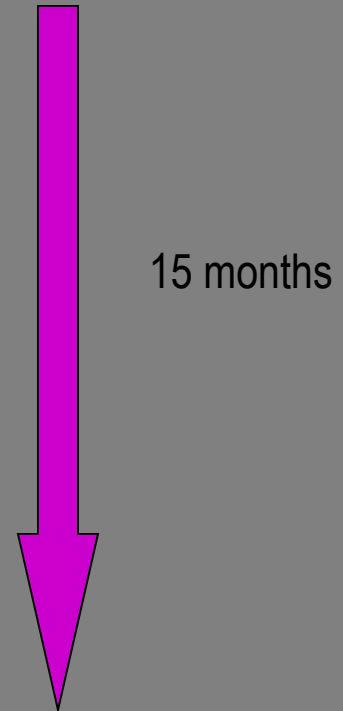
Time 2 Assessments
April-Sept 2005



Time 3 Assessments
Oct 2005-March 2006

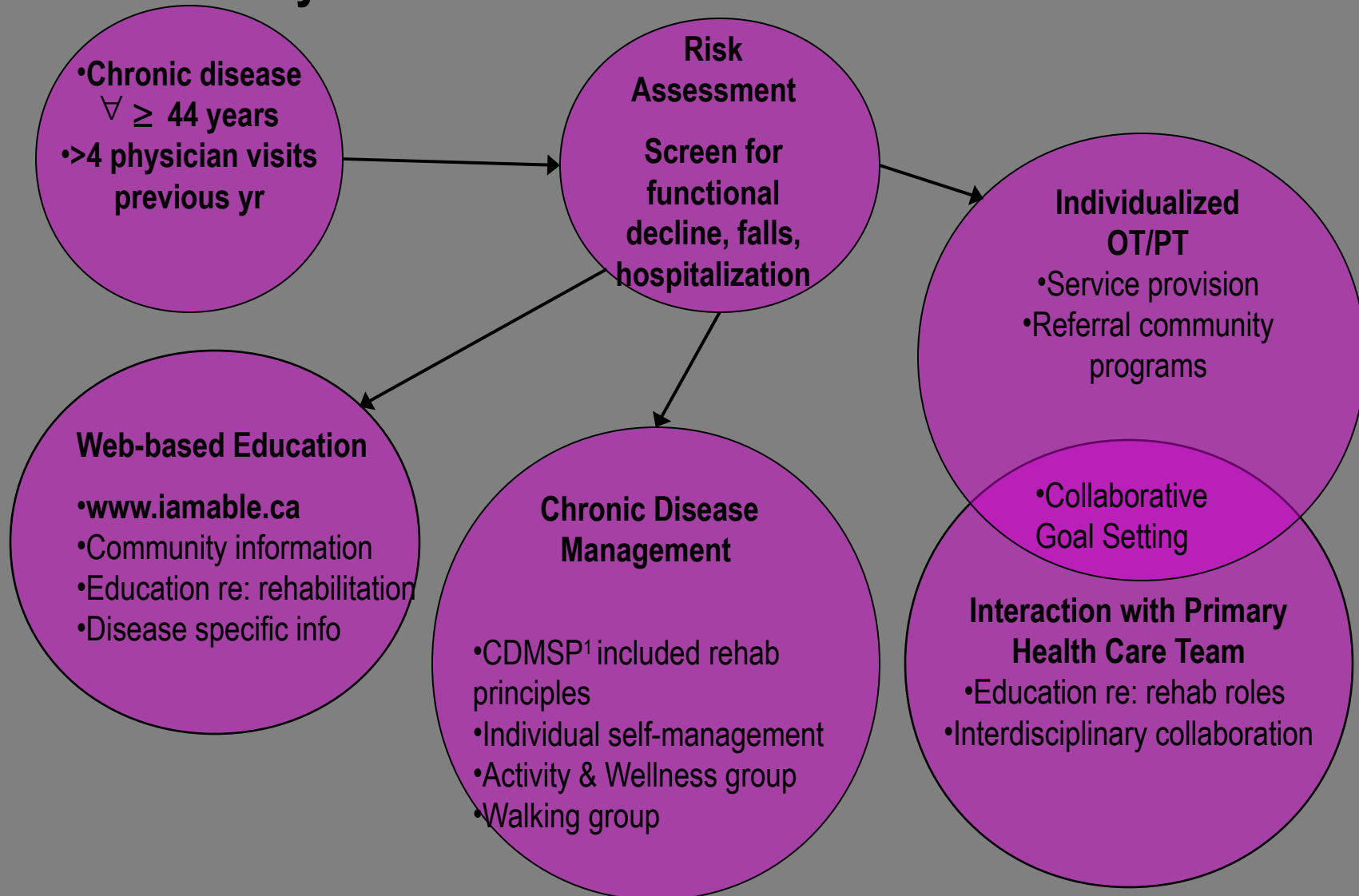
Rehabilitation

August 2004



March 2006

Primary Care Model for Rehabilitation Intervention

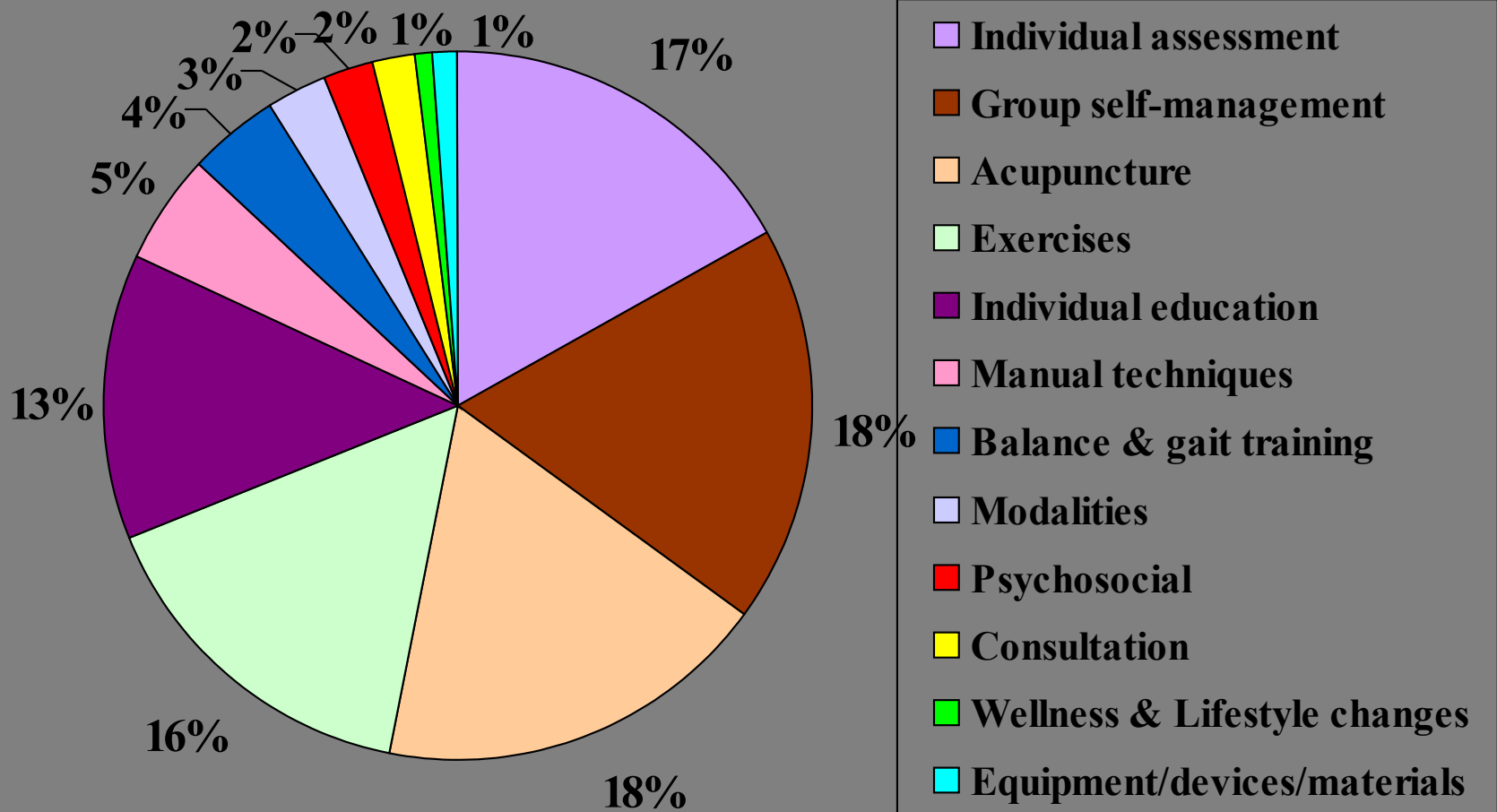


1: Based on Chronic Disease Self-Management Program from the Stanford Patient Education Research Center for Chronic Disease

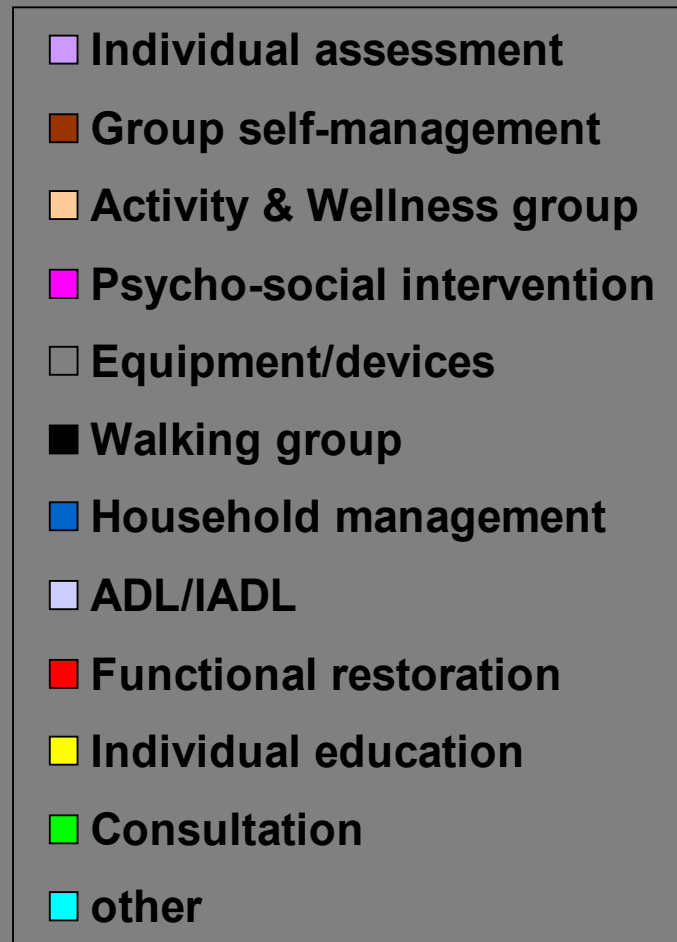
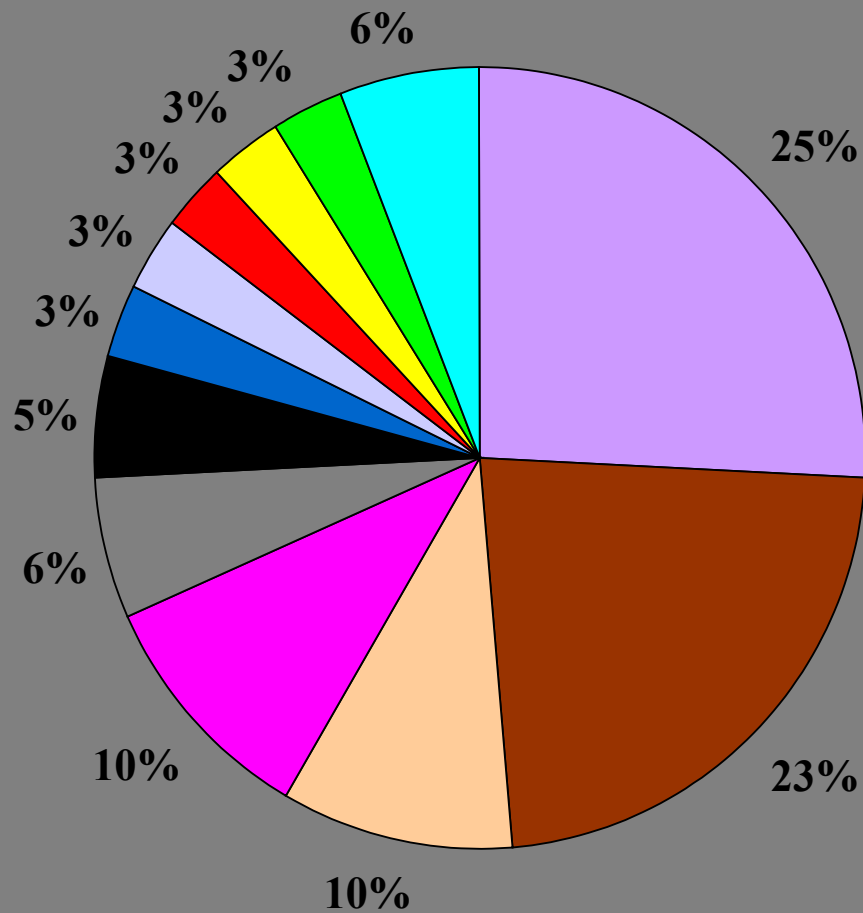
Rehabilitation Intervention

- Individual Assessments:
 - PT: 137 assessments
 - OT: 132 assessments
- Individual Interventions:
 - PT: 853 visits
 - average length of visits: 35 minutes
 - OT: 251 visits
 - average length of visits 57 minutes
- Group Interventions
 - Chronic disease self-management workshop (354 attendances)
 - Activity & Wellness Group (152 attendances)
 - Walking Group (108 attendances)

Distribution of Direct Time: Physiotherapy



Distribution of Direct Time: Occupational Therapy



Rehabilitation Intervention

- 82 (63%) attended self management workshops and 23 persons(15%) received individual self management
- 1709 hits to www.iamable.ca website by end of study

Progress through phases of study

Assessed for eligibility (n= 750)

**Enrollment &
Randomization**
n=303

Excluded (n=406)
•Refused (n=317)
•Did not meet criteria (n=37)
•Deceased (n= 7)
•No contact after 5 attempts (n=45)

Allocated to Intervention (n=152)

Allocation

Allocated to Control (n=151)

9 months

9 months

Time 2: 137 assessed

Follow-Up

Time 2: 138 assessed

6 months

6 months

Time 3: 132 assessed

All included
in analysis

Time 3: 139 assessed

Lost to follow-up (n=19)

- Too busy
- Self/family ill health
- Deceased
- Not interested
- Left practice/moved
- Travel
- Dissatisfied with clinic
- Discomfort with Ax
- Unable to reach

Lost to follow-up (n=13)

- Too busy
- Self/family ill health
- No benefit
- Deceased
- Not interested
- Too many assessments
- Left practice/moved
- Unable to reach
- Travel

Analyses

- Intention to treat analyses
- Continuous variables: ANCOVA

Time 3 outcome measure

- Covariates: Time 1 outcome measure

Time 1 Late Life Function Disability Index Function Score
Score of the dichotomous variables “falls” and “at risk” of hospitalization

Analyses (cont'd)

- Dichotomous variables (falls, priority rating): Logistic regression

Covariates:

- Age group (44-64 and 65+)
 - Gender
 - Time 1 outcome measure in question
 - Time 1 FDI Function score
 - Score of the dichotomous variables 'Falls' and 'At risk of hospitalization'
- Ordinal variables (balance, chair stands): Mann-Whitney U-test

Baseline Characteristics

Age (yrs)	Intervention (152 n(%))	Control (151)	Statistical test
45-64	86 (56.6)	86 (57)	t = 0.23 p = 0.82
65-93	66 (43.4)	65 (43)	
Females	98 (64.5)	94 (62.3)	$\chi^2 = 0.16$ p = 0.69

Education

Completed elementary or less	23 (14.5)	10 (6.6)	$\chi^2 = 5.67$ p = 0.46
Partially or completed secondary	63 (41.4)	72 (47.7)	
Completed college or university	64 (44.1)	69 (45.7)	

Income

Below \$30,000	54 (51.1)	24 (29.1)	$\chi^2 = 5.27$ p = 0.51
Above \$30,000- \$50,000	36 (23.7)	28 (18.6)	
Over \$50,000	43 (28.3)	52 (34.4)	
Don't know	20 (13.2)	14 (9.3)	
Refused to answer	9 (5.9)	13 (8.6)	

Baseline Characteristics Cont'd

	Intervention n (%)	Control
Angina	20 (13.2)	17 (11.3) $\chi^2=0.19, p=0.66$
Congestive Heart Failure	6 (3.9)	8 (5.7) $\chi^2=0.33, p=0.57$
Hypertension	89 (58.6)	89 (58.9) $\chi^2=0.08, p=0.66$
Heart Disease	22 (14.5)	31 (20.5) $\chi^2=1.9, p=0.16$
Diabetes	36 (23.7)	36 (23.8) $\chi^2=0.004, p=0.95$
Arthritis	57 (37.5)	57 (37.7) $\chi^2=0.002, p=0.96$
Stroke	6 (3.9)	6 (4.0) $\chi^2=0.12, p=0.73$
Cancer	22 (14.5)	24 (15.9) $\chi^2=0.19, p=0.66$
Hip	3 (2.0)	1 (0.7) $\chi^2=1.00, p=0.32$
Parkinson's	1 (0.7)	1 (0.7) $\chi^2=0.00, p=0.99$
Lung Disease	12 (7.9)	18 (11.9) $\chi^2=1.4, p=0.23$
Fibromyalgia	5 (3.3)	10 (6.6) $\chi^2=1.8, p=0.66$
Multiple Sclerosis	1 (0.7)	3 (2.0) $\chi^2=1.04, p=0.31$
Asthma	17 (11.2)	27 (17.9) $\chi^2=2.7, p=0.09$
Back Problem	69 (45.4)	77 (51.0) $\chi^2=0.95, p=0.33$
Obesity	62 (40.8)	62 (41.1) $\chi^2=0.009, p=0.92$

Results

	T ₁ mean & (SD)		T ₃		
	Intervention (n=152)	Control (n=151)	Intervention (n=132)	Control (N=139)	
Function Disability Index Function Scaled Score (LLFDI) (0 – 100)	61.85 (12.68)	59.93 (12.68)	61.3 (12.3)	62.3 (15.8)	F = 2.89 p = 0.09
SF36 Physical	41.91 (10.56)	40.88(12.0)	42 (11.8)	43.1 (11.9)	F = 2.56 p = 0.11
SF36 Mental (0 – 100)	49.37 (12.14)	50.08 (11.25)	51.0 (11.8)	50.6 (11.8)	F = 0.01 p = 0.93
Falls in Previous 9 Months (self report)	40	50	33	39	Exp (B) = 1.16 p value = 0.60
2 min Walk (metre)	127.9 (39.62)	125.58 (41.06)	125 (40.2)	126.3 (41.0)	F = 0.0 p = 0.96
Grip Strength (kg/m)	25.36 (11.24)	25.4 (11.31)	25.3 (13.5)	26.6 (16.2)	F = 0.48 p = 0.49
LEFT (0-12)	8.23 (2.52)	8.21 (2.53)	9.2 (3.0)	9.2(3.4)	F =0.42 P = 0.52
Self Management communication with physician	2.57 (1.42)	2.64(1.32)	3.0 (1.3)	2.7 (1.4)	F = 3.35 p = 0.07
Number of Physician Visits (self report)			3.2 (2.9)	3.5(3.0)	F = 0.04 p = 0.84
Planned Hospital Days (self report)			0.0 (0.0)	0.4(1.8)	F = 6.30 p = 0.01 Adjusted Difference

Baseline data

- Participants showed low – fair functioning
 - 50% had scores below 60 on Function Scale of LLFDI (0-100)
- Participants had average to slightly below average health scores (SF36)(0-100)
 - 72% had Physical component Score below 50
 - 42% had Mental component Score less than 50
- 30% had fallen in the previous 9 months.

Results:

Hospitalizations & ER visits

- Hospitalizations: Planned hospital days

Intervention: Mean = 0.0 (0.0)

Control: Mean = 0.4 (1.8), $F=6.3$; $p=0.01$

Adjusted difference: 0.60 days per person;
\$490 per person

Cost savings from reduced hospitalizations
=\$65,700

- Emergency Room Visits

Intervention: Mean = 0.2 (0.9)

Control: Mean = 0.2 (0.5), $F=0.28$; $p=0.60$

Results:

Secondary Outcomes

- Falls:
 - Intervention: Yes=33; No=94
 - Control: Yes=39; No=97
 - p=0.6 (goodness of fit p=0.96)
 - Home hazards:
 - Intervention: Mean =3.8 (2.4)
 - Control: Mean = 4.1 (2.3), F=0.86, p=0.35
- Significant interaction Age x hazards

Results:

Secondary Outcomes

- Self-management: Communication with physician score
 - Intervention: Mean=3.0 (1.3)
 - Control: Mean=2.7 (1.4), $F=3.35$; $p=0.07$
- Caregiver Strain Index
 - Intervention: Mean =2.5 (1.6); $n=9$
 - Control: Mean =5.1 (2.3); $n=13$, $F=1.73$; $p=0.24$

Patient Satisfaction Questionnaire

(PSQ-18) revised

Subscale	Mean (SD)		t	p
	Intervention n=132	Control n=139		
General Satisfaction	3.6 (0.8)	3.2 (0.5)	-4.69	0.00
Technical Quality	3.6 (0.6)	3.3 (0.5)	-5.25	0.00
Interpersonal Manner	4.1 (0.7)	3.6 (0.7)	-6.26	0.00
Communication	3.9 (0.7)	3.5 (0.6)	-5.13	0.00
Financial aspects	3.7 (0.9)	3.4 (0.8)	-2.98	0.00
Time spent	3.8 (0.7)	3.4 (0.6)	-5.57	0.00
Accessibility	3.6 (0.6)	3.3 (0.6)	-3.51	0.00

Interpretation

- No significant between group differences in health status or functional outcomes
- Significant group differences in planned hospital days but not emergency room visits
- Self management in communication with physician approached significance
- Increased satisfaction for persons with chronic disease who received rehabilitation within primary care setting
- Feasible to integrate rehabilitation in primary care
- Sustainability of intervention likely feasible with funding for rehab positions

Study Strengths

- Randomized design
- Assessors were blinded to group allocation
- Addressed regional needs for persons with chronic illness
- Multi-component complex intervention theoretically based on expanded model of chronic disease
- Outcomes focused on all levels of ICF framework

Limitations

- Intervention may not have been administered sufficiently long enough to show a difference
- More control for the fidelity of the intervention would have added strength
- Primary endpoints to consider in future are quality of life and patient specific measures
- Lack of generalizability

Future Research

- Identify which patient groups respond most positively to rehabilitation and self management strategies that address function
- Identify what are the critical ingredients of this complex type of intervention and the degree of flexibility or tailoring of the intervention
- www.mrc.ac.uk/complexinterventionsguidance
- Craig et al Developing and evaluating complex interventions: the new Medical Research Council guidance. BMJ 337,2008,979-983.