



# Designing, Testing, and Translating Fit and Strong!: An Evidence-Based Intervention for Older Adults with Osteoarthritis



IHRP Brown Bag Seminar

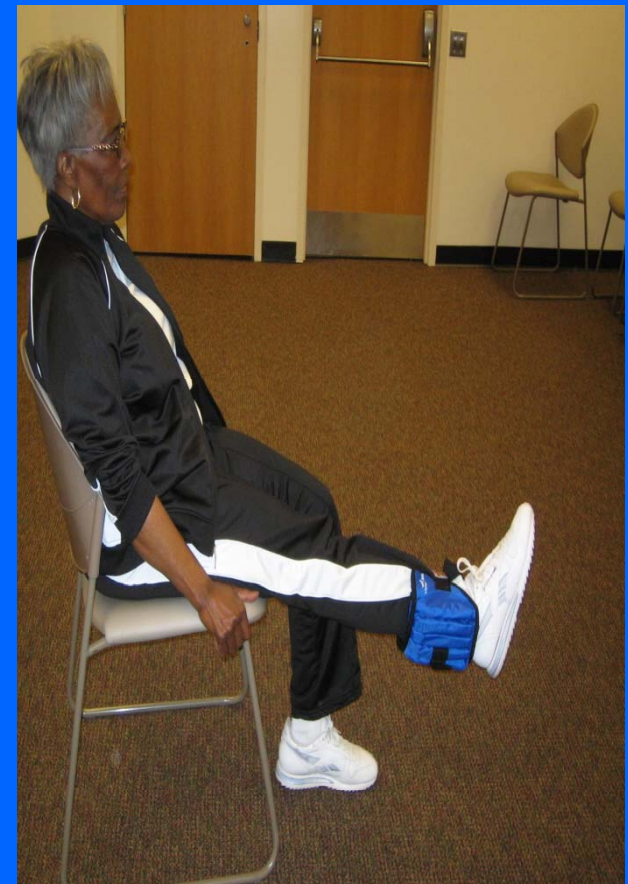
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- Background/ Overview
- Efficacy
- Effectiveness
- Dissemination





# Background

- Osteoarthritis (OA) is the most common condition affecting older adults and the number one cause of disability among them (Hootman et al., 2009)
- Fit and Strong! builds on earlier longitudinal study of 600 older adults in Chicago
- Found:
  - Arthritis is the number one cause of disability
  - Lower extremity joint impairment, in particular, is a pathway through which disability develops



# Lower Extremity (LE) Impairment and Disability

- **Dunlop and Hughes, (1998) J Clin Epi, 55:1253-61**
  - LE joint impairment at baseline predicts disability levels at year 4 consistent with institutional use
  - First to pin-point role of joint impairment due to arthritis as causal mechanism
  - LE joint impairment affects large weight bearing joints used to perform ADL tasks



# OA Exercise Literature

- Most common symptom of OA is pain
- Persons with OA in LE joints become sedentary
- Sedentary behavior leads to decreased aerobic capacity and decreased muscle strength
- People with OA have poor aerobic functioning and decreased LE muscle strength vs. age-matched<sub>5</sub> controls (Minor et al., 1989; Semble et al., 1990).



# OA Exercise Literature, cont'd.

- Most studies target increased muscle strength or aerobic capacity
- Recent consensus that multiple-component interventions are needed
  - flexibility
  - strength and
  - aerobic conditioning



## Goal: Sustained Impact

- Most studies short term, 5-8 week outcomes
- Wanted long term impact; adherence lit says include *education component to increase self-efficacy*
- Two components:
  - Confidence can perform a task
  - Belief that if you perform it, you will achieve a *personally meaningful, desired outcome*



# Adherence Literature Suggests:

- make exercise as easy to do
- help participants develop individualized routines
- provide structured reinforcement re: progress





# Combines Exercise with Education for Lifestyle Change

- Can't just tell people to exercise and teach them how
- Need to review what exercise means to them in context of their lives
  - prior experience
  - concerns about safety
  - facilitators and barriers
  - problem solving



# Fit and Strong! Is Different

- Multiple-component exercise *plus* education for *lifestyle change*
  - 3 sessions/week for 8 weeks = 24 session curriculum
  - 60-minutes exercise, 30 minutes education
- Negotiated contract for maintaining physical activity after the end of Fit and Strong!



# General class schedule

- 15 minutes of warm-up/flexibility
- 20 minutes of aerobic exercise
- 20 minutes of resistance exercise
- 5 minutes of cool-down/flexibility
- 30 minutes-Education, group problem solving
- All exercises challenge balance!



# Fit and Strong! Manual

- ❑ Manual is used to facilitate group discussion and engage participants
- ❑ Uses structured 24-session curriculum
- ❑ Topics focus on arthritis management and physical activity maintenance



## Importantly.....

- In Week 6, each participant sits with instructor
- Develops individualized plan incorporating:
  - flexibility
  - aerobic
  - strength exercises

*Plan is a contract for physical activity maintenance post Fit and Strong!  
which each participant signs*



# Efficacy Study Design and Methods

- Randomized, Controlled Trial
- pre/post-test measures at baseline, 2, 6, and 12 months
- No treatment control group
- N = 115 treatment group, 110 controls



# Significant Outcomes Favored Treatment Group (N=115)

2 Months	6 Months	12 months
Adherence	Adherence	Adherence
SE for Exercise	SE for Exercise	SE for Exercise
	Time Adherence Efficacy	Time Adherence Efficacy
	SE for Arthritis Pain Management (borderline)	
LE Stiffness	LE Stiffness	LE Stiffness
	LE Pain	
	Geri-AIMS Pain	Geri-AIMS Pain (borderline)



# Effect Sizes

	Treatment Group		
	2 months	6 months	12 months
<b>Self Efficacy</b>			
Exercise	0.78	0.80	0.91
Time Adherence		0.76	0.71
Pain Management		0.65	
<b>Geri-AIMS</b>			
Pain		0.25	0.19
<b>WOMAC</b>			
Pain		-0.47	
Stiffness	-0.33	-0.35	-0.21
<b>Adherence</b>			
Total Exercise Minutes	0.86	0.71	0.67 <sup>16</sup>





# Conclusions

- Benefits at 2, 6, and 12 months
- Baseline, 2 and 6 months findings in April 2004 *Gerontologist*
- Baseline to 12 month final findings in December 2006 *Gerontologist*



# Effectiveness Study

- Funded by NIA to examine strategies to support long-term maintenance of physical activity after Fit and Strong! ends
- Implemented Fit and Strong! in 7 Chicago Department of Senior Services senior centers with 536 new participants
- Examined outcomes at 2, 6, 12, and 18 months



# Changed Instructors

- Efficacy trial- program designed and tested using PT instructors
- Effectiveness trial provided opportunity to facilitate adoption
  - Trained certified exercise instructors in Fit and Strong!
  - Compared **161** participants trained by PTs to **375** participants trained by exercise instructors.



# Instructor Findings

- No significant differences between PT and CEI-led participants on:
  - Attendance
  - Maintenance of physical activity
  - Class evaluation (overwhelmingly positive for both)
  - Performance measures improved
  - Pain, stiffness, and functioning improved

(Seymour, Hughes et al, 2009 *Arthritis Care and Research*)



# Effectiveness Trial (N = 486) Effects: Physical Activity Maintenance

2 Months	6 Months	12 months	18 months
Caloric Expenditure (all)	Caloric Expenditure (all)	Caloric Expenditure (all)	
Caloric Expenditure (moderate)			
Frequency of PA (all)	Frequency of PA (all)	Frequency of PA (all)	Frequency of PA (all)
Frequency of PA (moderate)	Frequency of PA (moderate)	Frequency of PA (moderate)	Frequency of PA (moderate)



# Other Significant Outcomes (N=486)

2 Months	6 Months	12 months	18 months
LE Stiffness	LE Stiffness	LE Stiffness	
LE Pain		LE Pain	LE Pain
LE Physical Function	LE Physical Function	LE Physical Function	
LE strength	LE strength		<b>LE strength</b>
Aerobic capacity	Aerobic capacity	Aerobic capacity	<b>Aerobic capacity</b>
Depression		Depression	
Anxiety	Anxiety	Anxiety	Anxiety
Depression/Anxiety	Depression/Anxiety	Depression/Anxiety	Depression/Anxiety



# Conclusions

- Fit and Strong! is low cost, easily replicable
- impacts:
  - Physical activity maintenance
  - LE stiffness, pain, physical function
  - LE strength (*timed sit-stand*)
  - Aerobic capacity (*6 minute walk*)
  - Depression and anxiety
- Benefits *maintained* at 2, 6, 12, and 18 months
- Benefits *consistent* across increasingly diverse participants, instructors, settings, and geographic areas
- Findings in Nov/ Dec 2010 issue [American Journal of Health Behavior](#) (Hughes et al., 2010)



# Dissemination and Translation

- Used the RE-AIM framework to guide dissemination and translation

<http://www.re-aim.org/about-re-aim/what-does-re-aim-mean.aspx>

- Partnered with AAAs to disseminate Fit and Strong! through CDC R18
  - 5 AAAs in IL
  - 5 AAAs in NC





# Specific R18 Activities

- Reach- developed website, Fitandstrong.org, evidence re effectiveness, operating sites, etc.
  - Have population estimates on number of older adults in areas, % with arthritis, can construct denominator to calculate rate
  - *Representativeness* trickier, obtaining demog/disease info all participants



# Fitandstrong.org

Fit & Strong!

## Fit & Strong!

An award-winning, evidence-based physical activity program for older adults



### About Fit & Strong!

- About Fit & Strong!
- Evidence
- Awards
- Partners
- Testimonials
- Map of Locations
- Staff
- Roybal Product
- Our Support
- System Login
- Contact Us

### Welcome to Fit & Strong!

Fit & Strong! is an [award-winning](#), multi-component, [evidence-based](#) physical activity program for older adults. This eight-week program targets older adults with osteoarthritis and has demonstrated significant functional and physical activity improvements in this population.

### Testimonials

"The exercise has made it possible for me to have better movement in joints with less pain."

[More Testimonials >](#)



### For Providers

- Offering Fit & Strong!
- Resource Requirements
- Program Costs
- FAQs

### Awards



[Read about our Archstone Foundation and ASA awards here.](#)

### For Instructors

- Training & Certification
- Program Overview
- Schedule / Locations
- Register for Training

Fit & Strong! helps participants:

<http://www.fitandstrong.org/> (1/13/2016 12:05:00 PM)



## R18 Activities, cont'd.

- *Effectiveness*- Participant pre and post-test outcome assessments
  - entered via secure login on [Fitandstrong.org](http://Fitandstrong.org)
- *Reduced* set of items-LE pain, stiffness, SE for exercise, energy/fatigue, exercise participation



## R18 Activities, cont'd.

- *Adoption-*
  - Provider and Instructor Focus groups prior to their implementing Fit and Strong!
    - Insight into barriers and facilitators to offering program
  - Denominator issue- surveying 759 providers in areas to enumerate the universe/244 responses to date



## R18 Activities, cont'd.

- *Implementation* – T-Trainer, Master Trainer-build critical infrastructure
  - 8-hour instructor training/curriculum
  - Program now licensed
  - Instructor and Participant Manuals: Guide to offering Fit and Strong!



## R18 Activities, cont'd.

### ■ *Implementation-*

- Developed checklist to identify core components and record and score adaptations
- Use checklist during site visits in weeks 2-5 of program
- Use pairs of reviewers to estimate checklist reliability
- Provide feedback to instructors based on observation and findings from checklist- ID good candidates for master training!



## R18 Activities, cont'd.

- *Maintenance* – telephone survey of adopting sites to determine those that continue to offer program over time vs those that do not
  - Barriers and facilitators to maintenance
  - Partner to develop maintenance/ sustainability strategies



# Findings: Effectiveness

## Participant Outcomes: T-Tests (N=300)

	<b>Baseline N=282</b>	<b>8-wks N=282</b>	<b>p-value</b>
<b>LE Pain</b>	5.3	4.3	<b>0.002</b>
<b>LE Stiffness</b>	3.0	2.6	<b>0.006</b>
<b>Energy/Fatigue</b>	2.5	2.9	<b>0.000</b>
<b>SE for Exercise</b>	6.7	7.6	<b>0.000</b>
<b>Body Mass Index</b>	29.3	28.2	<i>0.067</i>





# Results of Dissemination and Translation Efforts

- Offered in IL, NC, WV, and FL
- 2 T Trainers
- 2 Master Trainers
- 169 trained instructors
- 55 sites implemented Fit and Strong!
- 864 additional participants
- Total number of participants to date=1465



# Fit and Strong! License

- License allows interested providers to implement Fit and Strong!
- License fees include cost of training, instructor support, fidelity check, access to website
- License fees are negotiable and should not be a barriers to implementation



# Fit and Strong! License Fees

<b>Fit and Strong! Licensing Fee Structure</b>		
<b><u>Provider Category</u></b>	<b><u>First Year License Fee</u></b>	<b><u>Yearly Renewal Fee</u></b>
System	\$2,000	\$200
Site (Each site associated with a system)	\$400	\$100
Stand-Alone Site	\$1,000	\$200



# Lessons Learned: Barriers and Facilitators to Adoption/ RE-AIM

- ❑ **Barriers**
  - ❑ Availability of CEIs
  - ❑ Commitment and ability to recruit participants
  - ❑ Close time gap between training and implementation
  - ❑ Require sites to recruit prior to training
  - ❑ Cost, space, time, and access to equipment
- ❑ **Facilitators**
  - ❑ Evidence-based
  - ❑ Multiple components
    - exercise plus health education
  - ❑ Packaged program
  - ❑ Best sites: health care systems, Ys, parks and recreation facilities, assisted living facilities, and large senior centers



# Lessons Learned: Barriers and Facilitators to Implementation - Fidelity/ RE-AIM

- ❑ **Barriers**
  - ❑ Site visits show some unacceptable adaptations
- ❑ **Facilitators**
  - ❑ Opportunity to provide instructor feedback
  - ❑ Continuous quality improvement
  - ❑ Revised manuals and training curriculum
  - ❑ Each exercise demonstrated and modifications modeled in more detail during training
  - ❑ Instructors observed doing exercises
  - ❑ More time spent on role plays, reviewing curriculum, how to conduct data collection



# Lessons Learned: Barriers and Facilitators to Maintenance/ RE-AIM

- ❑ **Barriers**
  - ❑ Instructor cost
  - ❑ Ongoing participant recruitment
- ❑ **Facilitators**
  - ❑ Attendance
  - ❑ Positive participant feedback important to market and maintain program
  - ❑ Interest among members of sponsor organization



# Accomplishments

- Approved by CDC and AoA as evidence-based program that states should promote
- Implementing in 7 sites in NC, 1 site in FL, and 3 in IL through evidence-based disease prevention grant funds
- Partnering with the Health Foundation of South Florida! as part of the Healthy Aging Regional Collaborative of S. FL
- Participating in CMS Congressionally Mandated Evaluation of using Medicare to reimburse for EB programs



# Awards

- Healthcare and Aging Award 2008
  - Selected by the Healthcare and Aging Network (HAN) of the American Society on Aging, in collaboration with Pfizer Inc. as one of only six recipients nationally of the 2008 Healthcare and Aging Awards
  
- Archstone Foundation Award for Excellence in Program Innovation 2006
  - Received honorable mention in 2006 for the Archstone Foundation Award, awarded through the Gerontological Health Section of the American Public Health Association





# Current Activities

- Jan 1, 2012 RRF grant to accelerate the dissemination of Fit and Strong!
  
- Objectives:
  - Develop readiness assessment - assess willingness and capacity of community orgs of various types to adopt and maintain program;
  - Develop and test ability to bundle Fit and Strong! with other EBDP programs in specific states;
  - Identify and engage regional or national systems that have interest and capacity to adopt and maintain Fit and Strong!; and
  - Rapidly disseminate Hispanic version of Fit and Strong!



## Current Activities, cont'd.

- Partnering with Oregon State University to test the adaptation and implementation of Fit and Strong! with a Pacific Northwest Tribe
- Specific Aims:
  - Examine cultural acceptability of Fit and Strong!; identify adaptations that could improve its cultural relevance and effectiveness using focus groups.
  - Adapt Fit and Strong! instructor and participant manuals based on focus group feedback.
  - Identify and train two tribal members to deliver Fit and Strong!.
  - Pilot test the translated Fit and Strong! program measuring relevant outcomes at baseline and at 2 and 6 months.



## New Activities

- R01 to test addition of a weight management component - Fit and Strong! Plus
  - Successfully piloted Fit and Strong! Plus in Summer of 2011
  - Obesity major risk factor knee OA/ exacerbates symptoms
  - Spending billions each year on knee replacement surgery
  - Fit and Strong! costs \$101.25 per participant



## New Activities, cont'd.

- Testing Hispanic version in IL and AZ – ¡En Forma y Fuerte!
- Discussions about offering program in Mexico, Costa Rica, and Peru



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Thanks!

