

# A home based intervention reduced disability in physically frail older people

Gill TM, Baker DI, Gottschalk M, et al. *A program to prevent functional decline in physically frail, elderly persons who live at home.* *N Engl J Med* 2002;**347**:1068–74.

**QUESTION:** In physically frail older people, how effective is a home based intervention aimed to prevent functional decline?

## Design

Randomised (allocation concealed\*), blinded (outcome assessors)\*, controlled trial with 12 months of follow up.

## Setting

Primary care practices in Connecticut, USA.

## Participants

188 people  $\geq 75$  years of age (mean age 83 y, 80% women) who lived at home and were physically frail (needed  $> 10$  s to walk a 3.0 m course and back and inability to stand from a seated position in a hardback chair with their arms folded). People who met 1 of the frailty criteria were moderately frail; people who met both were severely frail. Exclusion criteria included inability to walk; receipt of physical therapy or exercise programme; dementia; and stroke, hip fracture, myocardial infarction, or hip or knee replacement surgery in the past 6 months. Follow up data were available for 176 people (94%).

## Intervention

Participants were allocated to a home based intervention (n=94) or an educational control group (n=94). The intervention involved assessment by a physical therapist of participants' potential impairments in physical abilities and the home environment. Algorithms and decision rules were developed to link the assessment results with such recommended interventions as training in use of assistive devices, removal of hazards, and competency based balance exercises. Participants also did conditioning exercises of the arms and legs using resistance elastic bands. Participants were visited about 16 times during a 6 month period. Control group participants were visited by a home educator and together they reviewed general practices promoting good health targeted to the participants' needs.

## Main outcome measures

Change in the summary disability score from baseline. The secondary outcome was admission to a nursing home.

## Main results

Analysis was by intention to treat. Participants in the home based intervention group had less disability at 7 and 12 months than did participants in the control group (table). In a subgroup of participants with moderate frailty, the intervention group also had lower disability scores at 7 and 12 months ( $p \leq 0.005$ ), but the difference was not seen in patients with severe frailty ( $p \geq 0.50$ ). Intervention and control groups did not

differ for admission to a nursing home (14% v 19%,  $p=0.37$ ) nor for number of days spent in a nursing home (59 v 75 d,  $p=0.22$ ).

## Conclusion

In physically frail older people, a home based intervention reduced functional decline for up to 12 months.

\*See glossary.

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For correspondence:  
Dr T M Gill, Yale  
University School of  
Medicine, New Haven,  
CT, USA.  
gill@ynhh.org

### Home based v control intervention to reduce functional decline in frail older people†

| Outcome               | Follow up | Home based intervention | Control | Percent change in mean disability score | p Value |
|-----------------------|-----------|-------------------------|---------|---|---------|
| Mean disability score | 7 months  | 2.0                     | 3.6     | 45%                                     | 0.008   |
|                       | 12 months | 2.7                     | 4.2     | 37%                                     | 0.02    |

†Disability score based on performance of 8 activities of daily living (range 0 [no disability] to 16 [total disability]). CI defined in glossary.

## COMMENTARY

The desire to remain in one's home is strong, yet the inability to care for oneself is the most common reason that frail elderly people must leave the home. In older people who have had a medical setback, rehabilitation efforts seek to improve function to keep the patient at least partially independent in the home. The study by Gill *et al* uses an intervention emphasising physical training as a "prehabilitation" effort to prevent or delay disability that may otherwise require institutional care.

The intervention included physical training with progressive exercises and resistive bands. The authors reported a high level of adherence to the physical training recommendation.

Conclusions from the study are mixed. On the bright side, an intervention involving assessment and physical therapy improved the functional capability of participants as measured by a self reported summary disability score. Any functional improvement, sustained over a year, is noteworthy and not easily accomplished.<sup>1-2</sup> In contrast, 31 participants (13 [14%] in the home based group and 18 [19%] in the educational control group) were admitted to a nursing home highlighting that frailty is difficult to prevent or overcome.

Cost effectiveness of the intervention was not fully explored in this study. The authors concede that Medicare would not cover the majority of home visits undertaken in the protocol. In addition, a further economic goal—prevention or delay in admission to costly nursing homes—was not realised.

Allocation of resources is a continuing source of tension in geriatrics. Despite positive results from the intervention, this study presents little to resolve the issue. Focusing on "prehabilitation" in the home rather than rehabilitation at a facility should show both a reduction in societal expenses and improved patient wellbeing. Perhaps focus on the selection of those patients on whom to spend resources will make the results of this study more widely applicable.

Bruce E Johnson, MD  
University of Iowa Carver College of Medicine  
Iowa City, Iowa, USA

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