

Annotated Bibliography for Fall Risk Assessment and Intervention for Community-Dwelling Older Adults

Problem of Falls

1. **Sterling DA, O'Connor JA, Bonadies J. Geriatric falls: injury severity is high and disproportionate to mechanism. *J Trauma* 2001;50(1):116-119.**

Summary: This study evaluated the incidence of falls and type of falls in the elderly and how they relate to injury. Falls caused injury in older adults 42% compared to 7% in the younger group. Same level falls caused serious injury 30% in the older group and 4% in the younger group. Falls were seven times more likely to be a cause of death in the older group compared to the younger group. Same level falls resulting in death was 10 times more common in the elderly.

Relevance: Clearly, the problem of older adults falling is clear with this study. The vast difference in numbers of injuries and deaths caused by falling from a level surface between older adults and younger adults makes this clear. This is the basis for the importance of preventing falls and injuries in older adults and highlights the need for community fall prevention programs.

STEADI

2. **Smith ML, Stevens JA, Ehrenreich H, et al. Healthcare providers' perceptions and self-reported fall prevention practices: findings from a large new york health system. *Front Public Health* 2015;3:17. doi:10.3389/fpubh.2015.00017.**

Summary: Although falls are the leading cause of injury-related death and emergency visits in older adults, health care providers ranked falls as the lowest priority out of 5 conditions (diabetes, CV disease, mental health, and musculoskeletal conditions). Less than 40% of health care providers in a large New York health system asked their patients if they had fallen in the last year. Less than 25% referred older patients to a PT for balance or gait training and less than 20% referred to community-based fall prevention programs. Less than 16% conducted a standardized functional assessment.

Relevance: This study reveals that very few primary care providers are asking their older adult patients about falls. Even fewer are conducting physical measures to see if they are at a fall risk, which means few are recommending their patients for gait and balance training. This highlights the importance of having the STEADI tool kit, as well as making providers

aware of it. This also highlights the importance of any health provider screening for fall risk because it should not be assumed it has been done with a primary care provider.

3. **Lee R. The cdc's STEADI initiative: promoting older adult health and independence through fall prevention. *Am Fam Physician* 2017;96(4):220-221.**

Summary: This paper outlines what STEADI includes. The three core elements: screen patients for fall risks, assess their modifiable risk factors and intervene to reduce fall risks. The program uses evidence based measures to assess and an algorithm to determine what intervention would be appropriate.

Relevance: This is the CDC's initiative to lower fall rates and injuries from falls in the older adults population. This evidence-based program can allow physicians to take steps to preventing falls allowing patients to stay healthy, active, and independent.

4. **Lohman MC, Crow RS, DiMilia PR, Nicklett EJ, Bruce ML, Batsis JA. Operationalisation and validation of the Stopping Elderly Accidents, Deaths, and Injuries (STEADI) fall risk algorithm in a nationally representative sample. *J Epidemiol Community Health* 2017;71(12):1191-1197. doi:10.1136/jech-2017-209769.**

Summary: In an effort to determine STEADI's predictive validity and adaptability, 5 years of data from the National Health and Aging Trends Study was used to categorize respondents as high, moderate or low fall risk according to STEADI's algorithm. The STEADI screening tool was found to be a valid measure for predicting future fall risk.

Relevance: Clinicians can be assured that the measures used and the algorithm to determine fall risk in STEADI is a valid measure of predicting future falls and should be used to determine proper intervention.

5. **Crow RS, Lohman MC, Pidgeon D, Bruce ML, Bartels SJ, Batsis JA. Frailty versus stopping elderly accidents, deaths and injuries initiative fall risk score: ability to predict future falls. *J Am Geriatr Soc* 2018;66(3):577-583. doi:10.1111/jgs.15275.**

Summary: This study examined the ability of the STEADI program to predict future falls versus using the measure of frailty. STEADI was a strong predictor of future falls and the addition of frailty status did not increase the ability to predict future falls.

Relevance: STEADI is a reliable, sufficient, and inclusive way to determine which patients are at a risk for future falls.

Screening Fall Risk

6. **Lusardi MM, Fritz S, Middleton A, et al. Determining Risk of Falls in Community Dwelling Older Adults: A Systematic Review and Meta-analysis Using Posttest Probability. *J Geriatr Phys Ther* 2017;40(1):1-36. doi:10.1519/JPT.0000000000000099.**

Summary: This study assessed which questions, self-report measures, and physical measures could best predict falls. They found no single question was great at predicting probability of falls. Although, questions about fall history, ADL difficulty, use of an AD, concern about falling, and use of psychoactive medication in combination are useful for screening and can be used to identify those who would benefit from a comprehensive risk assessment. The BERG, TUG, and 5x sit to stand are the most evidence-supported functional measures to determine individual risk of future falls.

Relevance: Using the TUG and 5x sit to stand are both quick and easy measures that can be used in a doctor's office during a STEADI assessment to determine if the patient is at an increased risk for falls. These measures can also be used at community fall prevention programs as they are quick and do not take up much space.

Intervention/Otago

7. **El-Khoury F, Cassou B, Charles M-A, Dargent-Molina P. The effect of fall prevention exercise programmes on fall induced injuries in community dwelling older adults: systematic review and meta-analysis of randomised controlled trials. *BMJ* 2013;347:f6234. doi:10.1136/bmj.f6234.**

Summary: A systematic review and meta analysis found that fall prevention exercise interventions have a positive effect on prevention of fall-related injuries in community-dwelling older adults.

Relevance: Using exercise intervention for older adults during CHAMP and other community fall prevention programs is an evidence based recommendation to reduce injuries from falls.

8. **Robertson MC, Campbell AJ, Gardner MM, Devlin N. Preventing injuries in older people by preventing falls: a meta-analysis of individual-level data. *J Am Geriatr Soc* 2002;50(5):905-911.**

Summary: This meta-analysis of data from three trials aimed to estimate the overall effect of Otago on the number of falls and fall related injuries experienced by community-dwelling older adults. Falls and fall related injuries were reduced by 35%. The program was equally effective in men and women, however it more significantly prevented injuries for adults over 80 than those 65-79.

Relevance: This study is the basis for the evidence of using the Otago program. While this study shows the injuries are most reduced in those over 80, there was still fall reduction in the other ages populations as well. This study provides the evidence needed to deem Otago an evidence-based fall prevention program and makes it an effective choice to use in community-fall prevention programs as a way to administer exercises the participants can do at home.

9. **Son N-K, Ryu YU, Jeong H-W, Jang Y-H, Kim H-D. Comparison of 2 Different Exercise Approaches: Tai Chi Versus Otago, in Community-Dwelling Older Women. *J Geriatr Phys Ther* 2016;39(2):51-57. doi:10.1519/JPT.0000000000000042.**

Summary: This study compared Tai-Chi to Otago for fall prevention in community-dwelling elderly women. Both interventions improved mobility, Otago showed greater improvement in lower extremity strength, and Tai-Chi showed greater improvement in balance and gait velocity.

Relevance: This study shows that there are different interventions that effectively reduce risk factors that are associated with falls. If a community has a Tai-Chi program available, this study shows that it would be a good option. If a community does not have a community falls program or Tai Chi, the Otago program can still be performed at home as long as a trained health provider issues the program to the patient. Otago can also be included in community-fall prevention program interventions as a way to increase mobility and lower extremity strength, as decreased strength is a risk factor for falls.

10. **Davis JC, Robertson MC, Ashe MC, Liu-Ambrose T, Khan KM, Marra CA. Does a home-based strength and balance programme in people aged > or =80 years provide the best value for money to prevent falls? A systematic review of economic evaluations of falls prevention interventions. *Br J Sports Med* 2010;44(2):80-89. doi:10.1136/bjsm.2008.060988.**

Summary: This systematic review aimed to measure cost-effectiveness of fall prevention programs for community dwelling older adults. 3 programs were found to be cost-effective including: an individualized multifactorial program for those with 4+ fall risk factors, the home based Otago program in those >80, and a home safety program for those with a previous fall.

Relevance: This research indicates that CHAMP or other programs using multiple interventions such as Otago and patient education about home safety as interventions in reducing falls are not only efficient, but also cost effective. Community-Based fall prevention programs should feel confident that these interventions are evidenced-based and cost effective strategies.