

### Clinical Research correlation between **Physical Exercise & Cognition**

#### **Gillespe et al., 2012**

Exercise interventions are the single most effective strategies to reduce the rate of falls

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#### **Morat et al., 2019**

Stepping exergames is an appealing and effective training tool to improve functional balance and calf strength in healthy older adults.

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#### **Rebsamen et al., 2019**

High-intensity interval training through exergaming is feasible, safe, and shows high usability and acceptance in community-dwelling older people. Exergame-driven HIIT had a significant effect on maximum power output on an incremental exercise test.

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#### **Theill et al., 2013**

Cognitive Functions (such as executive functions, attention and processing speed) decline with age and if impaired fall risk is increased. Combined cognitive and physical training leads to better performance in cognitive tasks than isolated cognitive or physical exercise.

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#### **van het Reve & de Bruin, 2014**

Combined cognitive and motor training improves gait stability and reduced fall rate by 80%...and performance of executive functions can be optimized. A considerable proportion of falls in old age is associated with a decline in executive performance.

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## KEY FINDINGS

Improve Gait Stability  
and Reduce Falls by

# 80%

*by combining cognitive and motor training ... and optimize executive function.*

Reduce Falls in Older  
Adults by Approximately

# 50%

*through cognitive and motor stepping interventions.*



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### **Swanenburg et. al., 2018**

Exergaming that requires stepping movements led to significantly improved gaze stability during head movements as well as functional gait and gait initiation.

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### **Eggenberger et al. 2015**

Particular executive functions benefit from simultaneous cognitive-physical training compared to exclusively physical multicomponent training. Cognitive-physical training programs may counteract widespread cognitive impairments in the elderly.

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### **Okubo, Schoene & Lord, 2016**

Cognitive and motor stepping interventions reduce falls among older adults by approximately 50%. This clinically significant reduction may be due to improvements in reaction time, gait, balance and balance recovery but not in strength.

This systematic review and meta-analysis has demonstrated that step training can prevent falls by approximately 50% in older adults in both community and institutional settings.

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### **Schättin, 2016**

The present study illustrated that especially exergame training affects prefrontal theta RP (a parameter that measures activation of the frontal lobe) and that exergame training and balance training positively influence EFs and gait performance to different extents. Thus, exergame training is a promising future training strategy targeting prefrontal brain activity, EFs, and gait in elderly. Especially promising seems the effect that exergame is able to influence dual-task walking.

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