diabetes, cardiovascular and cerebrovascular disease, brain atrophy, and total gray matter where appropriate. We focused on executive functions as meta-analyses suggest that aerobic exercise has larger benefits for this cognitive domain. **Results:** In the PROMoTE RCT, we found that compared to usual care control, AT significantly improved executive functioning in females, but not males, an effect that was still evident 6 months later (p's<0.05). Further, AT increased levels of brain derived neurotrophic factor in females compared to males (p<0.01). In the Health ABC data, higher initial PA and increased PA over time were associated with less decline in executive functioning over time in females (p's<0.05), but not males (see Figure 1). Interestingly, maintenance of PA over time was related to larger left dorsal lateral prefrontal cortical volume in females only (p<0.05). **Conclusions:** Together, these findings provide evidence that sex differences exist in the effect of PA on cognition as well as in the underlying neurobiological mechanisms. This new knowledge can foster development of efficacious and sex-specific exercise recommendations to promote brain health.

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**O3-05-04** TASK-RELATED FMRI CHANGE AFTER
HIGH-DEFINITION TRANSCRANIAL
DIRECT CURRENT STIMULATION IN
COGNITIVELY INTACT OLDER ADULTS
AND PATIENTS WITH MCI

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**Background:** Spatial navigation declines during "normal" aging and further in Alzheimer's disease it's precursor, mild cognitive impairment (MCI). Parietal and medial temporal lobe structures both play a role in navigation and decline with age and disease. Functional magnetic resonance imaging (fMRI) has also revealed a "posterior to anterior" shift in patterns of activation with age and disease. Thus, there may be functional benefits of interventions that enhance parietal functioning, which could potentially be achieved via interventions like transcranial direct current stimulation (tDCS). The current study investigated the behavioral and neurophysiologic (i.e., fMRI) effects of High Definition (HD)-tDCS in cognitively intact older adults and those with MCI. **Methods:** A total of forty-two (20 MCI) older adults completed two separate sessions using a double-blind cross-over design. Participants were randomized to active or sham HD-tDCS (2mA for 20 minutes) that targeted the right superior parietal lobule (center anode over site P2). We used a spatial navigation task during fMRI (acquired shortly after HD-tDCS) to evaluate the offline neurophysiologic and memory effects. **Results:** After controlling for stimulation and stimulus set order, cognitively intact older adults showed significantly improved memory for spatially based information. These behavioral gains were accompanied by increased medial temporal (especially hippocampal) activation. Preliminary functional connectivity analyses suggest reduced connectivity between the targeted right parietal lobe and several brain regions, indicative of increased processing efficiency. While, as a group, MCI patients tended to perform worse after active than sham stimulation, there was a strong inverse relationship between memory test improvement and accuracy during the sham session

suggesting stimulation enhanced performance in those with more severe memory impairment. fMRI analyses revealed both increased and decreased activation but only local connectivity changes in the parietal cortices. Ongoing analyses further examine individual differences in HD-tDCS response. **Conclusions:** Findings suggest an enhancing effect of HD-tDCS in cognitively intact older adults. The effects in MCI appear more complex and may suggest an initial "disruptive" effect in those early, but "enhancing" effects later, in the presumed disease process. Ultimately, investigation of multiple sessions and increased understanding of patient-level response are necessary to facilitate clinical translation of HD-tDCS.

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**O3-05-05** EFFECTS OF A MULTIDOMAIN
LIFESTYLE INTERVENTION ON OVERALL
RISK FOR DEMENTIA: THE FINGER
RANDOMIZED CONTROLLED TRIAL

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**Background:** Estimating the impact of lifestyle interventions on dementia prevention can be difficult when interventions start early, before onset of substantial cognitive impairment. One solution could be using tools for estimating dementia risk as potential outcome measures. The CAIDE Dementia Risk Score was the first validated tool for estimating dementia risk based on a midlife profile (score range 0-15 points). This study investigated the impact of lifestyle changes on changes in the CAIDE score during 2 years. **Methods:** The Finnish Geriatric Intervention Study to Prevent Cognitive Impairment and Disability (FINGER) was a 2-year randomized controlled trial in 1260 older adults at risk for cognitive decline. Participants were recruited from previous non-intervention surveys (6 sites across Finland). Inclusion criteria were age 60-77 years, CAIDE score at least 6 points based on previous data on midlife risk factors, and cognition at mean level or slightly lower than expected for age. Participants were randomly assigned to the lifestyle intervention (diet, exercise, cognitive training and vascular risk management; n=631) or control (general health advice; n=629) groups. For these exploratory analyses, CAIDE score was calculated at baseline, 12-month and 24-month visits. A mixed-effects regression model with maximum likelihood estimation was used to investigate change in CAIDE score as a function of randomisation group, time, and group×time interaction. Analyses were adjusted for study site. **Results:** Mean CAIDE score (SD) at the baseline FINGER visit was not significantly different between intervention and control groups: 7.88 (1.83) versus 7.84 (1.867) points, p=0.69. Estimated mean change (SE) in CAIDE score at 2 years was -0.32 (0.06) in the intervention group and -0.15 (0.06) in the control group. The mean difference between groups (group × time interaction) in change of CAIDE score per year was -0.08 (95%CI -0.16 to -0.004, p=0.039). **Conclusions:** The CAIDE score showed a significant intervention benefit on reducing the overall dementia risk level in FINGER trial