cognitive function. Sleep and circadian disruption stand out as possible modifiable targets because sleep and circadian symptoms are common in HD, and such disruptions are known to impact cognition in the general population. Despite some emerging evidence that sleep quality correlates with cognition in manifest HD, whether these same relationships exist in the premanifest period is unknown. Further, whether circadian rhythms relate to cognition in premanifest HD remains open. Therefore, we aimed to determine whether sleep and circadian parameters relate to cognitive performance in premanifest HD.
Participants and Methods: To date, we have recruited 27 premanifest HD participants to a two-week remote sleep study. During the study, participants wore an Actiwatch-2 and completed a sleep diary for 14 consecutive days to assess their sleep and rest-activity patterns. Participants also completed online sleep and mood questionnaires and a cognitive assessment using videoconference. We calculated Pearson correlations to examine whether cognitive performance relates to subjective sleep quality, objective sleep parameters and circadian rest-activity rhythms. Thus far, we have analysed data from 15 female participants with premanifest HD (Mage = 43.20, SD = 11.58).
Results: Preliminary results indicate that measures of subjective sleep quality, insomnia severity, daytime sleepiness, and fatigue severity in premanifest HD do not correlate with cognitive performance. Increases in objectively measured sleep efficiency, however, strongly correlated with better performance on the Hopkins-Verbal Learning Test-Revised (HVLT-R) immediate ($r = 0.562$, $p < 0.05$) and delayed recall trials ($r = 0.597$, $p < 0.05$) and the Trail Making Test Part B (TMT-B; $r = 0.550$, $p < 0.05$). More time spent awake (i.e., wake after sleep onset) was strongly linked to reduced performance on the TMT-B ($r = -0.542$, $p < 0.05$) and Symbol Digit Modalities Test ($r = -0.556$, $p < 0.05$). Further, increases in total sleep time were associated with better performance on the HVLT-R immediate ($r = 0.682$, $p < 0.05$) and delayed recall trial ($r = 0.616$, $p < 0.05$). For our circadian parameters, less fragmented day-to-day rest-activity rhythms (i.e., higher intra-daily variability) strongly correlated with higher scores on the HVLT-R immediate ($r = 0.768$, $p < 0.001$) delayed recall trials ($r = 0.7276$, $p < 0.05$) and TMT-B ($r = 0.516$, $p < 0.05$), whereas consistent and stable day-to-day rest-activity rhythms (i.e., higher inter-daily stability) was associated with poorer performance on ERT ($r = -0.587$, $p < 0.05$).
Conclusions: Preliminary results suggest that fragmented sleep, sleep inefficiency, reduced total sleep time, rest-activity rhythm stability and fragmentation relate to poorer cognitive performance in people with premanifest HD. Should analysis of our whole sample confirm these preliminary findings, targeting sleep in HD (e.g., through sleep hygiene and/or psychoeducation) may be a useful strategy to improve or maintain cognition.

Categories: Neurodegenerative Disorders
Keyword 1: sleep
Keyword 2: cognitive functioning
Keyword 3: dementia - subcortical
Correspondence: Emily Fitzgerald, Monash University, emily.fitzgerald@monash.edu

55 Tracking Cognitive Change in Huntington's Disease with the Mini Mental State Exam and the Montreal Cognitive Assessment

Emma G Churchill[1], Braden Culbert[2], Anna Smirnova[2], Shelby Hughes[3], Chase Snell[2], Andrew Hall[2], Lauren Bohall[2], Easha Ashraf[2], Brenton A. Wright[2], Paul Gilbert[1], Jody Corey-Bloom[2]
[1]San Diego State University, San Diego, CA, USA. [2]University of California, San Diego, San Diego, CA, USA. [3]UCSD/SDSU Joint Doctoral Program, San Diego, CA, USA

Objective: To assess the utility of the Mini Mental State Exam (MMSE) and Montreal Cognitive Assessment (MoCA) for tracking cognitive changes Huntington's Disease.
Participants and Methods: Currently, the most frequently used brief assessment of global cognitive functioning is the MMSE. Although the MMSE is helpful for distinguishing individuals without significant cognitive impairment from those with dementia, it is not particularly sensitive to more subtle cognitive deficits. The MoCA is another brief cognitive screening tool that has been shown to be more sensitive to mild impairment and may have greater usefulness in subcortical dementias because of its more extensive assessment of executive function. Although the MoCA appears to have

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high sensitivity and specificity in a variety of neurological populations, there is currently little known about its efficacy in tracking cognitive decline in individuals with HD. We used a mixed effects model to analyze MMSE and MoCA scores collected prospectively during 5 years of follow-up for 163 patients with HD seen at one academic HDSA Center of Excellence. Baseline mean age for the HD cohort was 51.35 years, mean education 14.46 years, and a mean CAG repeat length 43.95. Mean follow-up time was 3.33 years.
Results: Mean MMSE and MoCA scores at baseline were 25.13 (SD=1.66) and 22.76 (SD=3.70) respectively. At baseline, age and gender were not associated with MMSE and MoCA scores, while years of education were. Neither age nor gender predicted rate of decline for the MoCA while years of education predicted rate of decline for the MMSE. For the MMSE, each year of education predicted on average 0.51 points higher score at enrollment; for the MoCA, each year of education predicted on average 0.79 points higher score at enrollment. The mean rates of decline on the MMSE was 0.48 points per year ($p<.001$) while that on the MoCA was only 0.31 points annually ($p<.001$) in the first five years of observation.
Conclusions: The MMSE and MoCA decline significantly over time in an unselected HD population. The smaller rate of decline in the MoCA may be due, in part, to the greater variability in baseline, MoCA (SD=3.70) vs MMSE (SD=1.66) scores in our HD cohort. Unlike cortical dementias, such as Alzheimer's disease (AD), where declines of 2-3 points per year have been described for the MMSE and MoCA, much lower annual rates of decline have been reported in subcortical dementias such as Parkinson's disease. To our knowledge, this is the first report of rate of cognitive decline on the MMSE and MoCA in HD: such information is vital for adequately preparing patients and families for future needs, in addition to planning for interventional/treatment trials in HD.

Categories: Neurodegenerative Disorders
Keyword 1: Huntington's disease
Keyword 2: dementia - subcortical
Keyword 3: cognitive functioning
Correspondence: Emma G. Churchill, Department of Psychology, San Diego State University, echurchill@sdsu.edu

56 Predictors of Finger Tapping Variability in Older Adults Evaluated for a Neurodegenerative Memory Disorder

Molly M McElvogue, Lori Steffes, Anna Burke, Ashley M Stokes, George P Prigatano
Barrow Neurological Institute, Phoenix, AZ, USA

Objective: Patients with early Alzheimer Disease (AD) and Mild Cognitive Impairment of the Amnestic type (MCI-A) have been reported to show large variability of tapping scores. Factors that contribute to that variability remain undetermined. This preliminary study aimed to identify predictors of finger tapping variability in older adults evaluated for a neurodegenerative memory disorder. Based on earlier research with normally functioning adults, we predicted that the number of "invalid" tapping responses (i.e. failure of the index finger to adequately lift off the tapping key once it is depressed to produce the next number on a mechanical counter) and the female gender would predict finger tapping variability, but age and educational level would not predict variability.
Participants and Methods: This preliminary study included 4 groups of participants, comprised of 8 healthy controls (HC, 3 males; 73±7years); 12 persons with subjective memory complaints (SMC, 3 males; 69±5 years); 12 with MCI-A (7 males; 76±5 years) and 7 early AD (5 males; 75±6years). All participants were administered a modified version of the Halstead Finger Tapping Test (HFTT). Mean, range of tapping score (i.e. a measure of variability), and number of invalid taps across 7 trials in each hand were calculated. ANOVA was performed for the HFTT metrics with the main effect of group. Tukey HSD tests were used for post hoc comparisons between groups. Multiple regression analysis was performed to determine the degree to which the number of invalid tapping responses, sex, age, and educational level predicted finger tapping variability using all 4 groups.
Results: Mean tapping score did not vary significantly across groups in the dominant [$F(3, 35) = 0.633$, $p = 0.599$] or non-dominant [$F(3, 35) = 2.345$, $p = 0.090$] hand. Range score approached a significant difference between groups in the dominant hand [$F(3, 35) = 2.745$, $p = 0.058$], with a clear significant effect of group on range score in the non-dominant hand [$F(3, 35) = 4.078$, $p = 0.014$]. Range score in the non-dominant hand was significantly higher in the AD

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