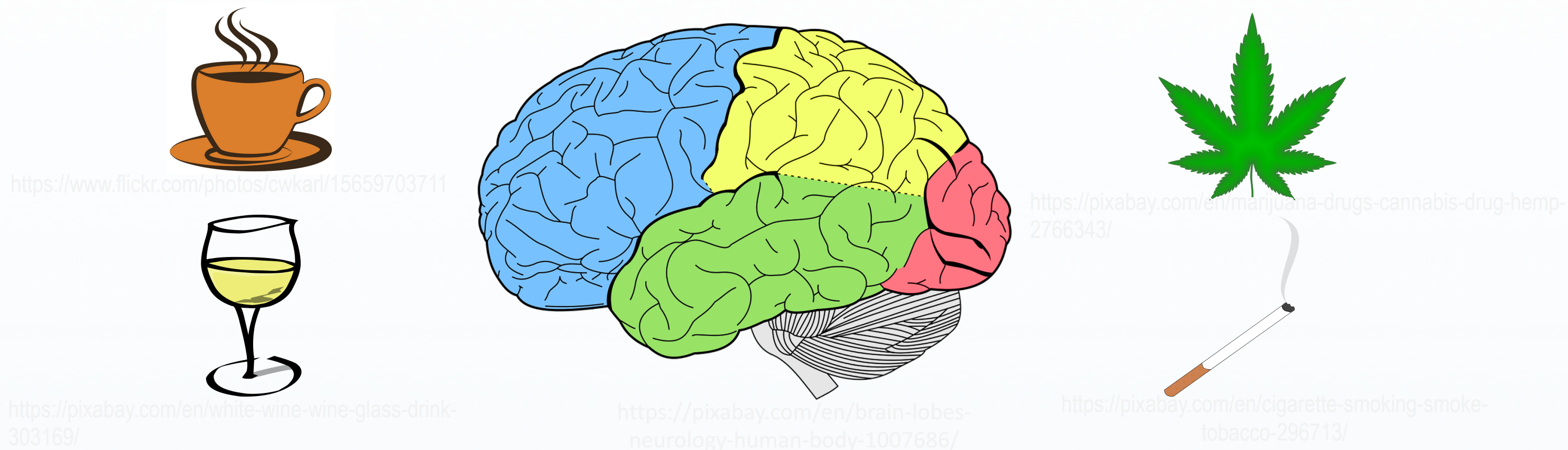# MEASURES OF ALCOHOL, CAFFEINE AND CANNABIS USE AND RISK RELATIONSHIPS TO PARKINSON'S DISEASE

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RATIONALE

- Parkinson's Disease is a neurodegenerative disorder[4]
- Characterized by symptoms including tremor, rigidity and akinesia, and diagnosis increases with age[4]
- Exact cause of degeneration of neurons is unknown[4]
- Addictive behaviours have been shown to be related to decreased risk of Parkinson's disease[1]
- Previous research has consistently found smoking is inversely related to the risk of developing Parkinson's disease[4]
- Inconsistent results for the protective effects of caffeine in regard to Parkinson's disease[3]
- Contradicting information on the protective effect of alcohol consumption and Parkinson's disease[1,2]
- Little research on risk relationship between cannabis use and Parkinson's disease

METHODS

- Case control study design
- Data collected between 2001 and 2008 by group of BC researchers[6]
- Cases identified based on PharmaCare prescriptions for Parkinson's medications[6]
- Controls identified at same time as cases, and frequency matched to cases[6]
- Participants completed standardized questionnaire[6]
  - Information collected on lifestyle factors was of interest for this study
- Measures of alcohol, caffeine, and cannabis use were established based on results of literature review
- Established cut-off for high, problematic use for each substance
  - There is no established cut-off for coffee addiction in the literature, so distribution-based cut-off was used (see Table 1)
- Analysis of risk relationship between "Ever vs. Never Use" and "High Use vs. All Other Use" and Parkinson's disease

RESULTS

Table 2. Measures of alcohol use, cannabis use, and coffee use and gender

	Men N (%)	Women N (%)
Alcohol (drinks/week)		
Never	122 (15.1)	110 (13.6)
Ever	347 (43.0)	228 (28.3)
High Use ($\geq$ 35, $\geq$ 28*)	25 (3.1)	5 (0.6)
All Other Use (< 35, < 28*)	444 (55.0)	333 (41.3)
	Men N (%)	**Women N (%)**
Coffee (Caffeine) (3rd quartile)		
Never	67 (8.3)	67 (8.3)
Ever	403 (49.9)	271 (33.5)
High Use (>105.3)	164 (20.3)	38 (4.7)
All Other Use ($\leq$ 105.3)	306 (37.9)	300 (37.1)
	Men N (%)	**Women N (%)**
Cannabis (times used/week)		
Never	68 (8.5)	268 (33.4)
Ever	106 (13.2)	361 (45.0)
High Use ($\geq$ 7)	8 (1.0)	4 (0.5)
All Other Use (< 7)	459 (57.2)	332 (41.3)

* men and women, respectively

Table 3. Odds ratios for measures of substance use and Parkinson's disease

	Odds Ratios (95% CI)	
	High Use vs. All Other Use	**Never Use vs. Ever Use**
Alcohol	0.88 (0.42-1.82)	0.70* (0.52-0.96)
Coffee (Caffeine)	1.46* (1.06-2.01)	0.99 (0.69-1.44)
Cannabis	0.50 (0.15-1.68)	0.56* (0.40-0.79)

* statistically significant

OBJECTIVES

- Establish scientifically supported quantitative cut offs for hazardous alcohol and cannabis use, and caffeine addiction

Table 1. Established cut-off points for high, problematic substance use based on the scientific literature

Substance	High Use
Alcohol (drinks/week)	$\geq$ 35 for men, $\geq$ 28 for women
Coffee (Caffeine) (3rd quartile)	> 105.3
Cannabis (times used/week)	$\geq$ 7

- Analyze risk relationships between addiction to these three substances and Parkinson's disease
- Hypothesize that high use of each substance will result in protective effect against development of Parkinson's disease

DISCUSSION

- Inverse association with Parkinson's disease in those who have ever consumed alcohol compared to those who have never consumed alcohol
- Inverse association with Parkinson's disease in those who have ever used cannabis compared to those who have never used cannabis
- Coffee was found to be a risk factor for developing Parkinson's disease in the high use category compared to all other use groups
- Greater protective effect seen for cannabis use, compared to alcohol and coffee consumption

CONCLUSION & RECOMMENDATIONS

- High use, or use that can be interpreted as an addiction or problematic, does not appear to have a greater protective effect compared to ever-users of these three substances
- Numerous recent studies are considering quantity of cannabis used instead of frequency of use to look at relationship with addiction, and this requires further study[5]
- Future analyses will use regression techniques to isolate relationships from possible confounders (age, sex, smoking)

REFERENCES:
[1]Palacios, N., Gao, X., O'Reilly, E., Schwarzschild, M., McCullough, M.L., Mayo, T.,…& Ascherio, A.A. (2012). Alcohol and risk of Parkinson's disease in large, prospective cohort of men and women. *Movement Disorders, 27*(8), 980-987.
[2]Zhang, D., Jiang, H., & Xie, J. (2014). Alcohol intake and risk of Parkinson's disease: A meta-analysis of observational studies. *Movement Disorders, 29*(6), 819-822.
[3]Hu, G., Bidel, S., Jousilahti, P., Antikainen, R., & Tuomilehto, J. (2007). Coffee and tea consumption and the risk of Parkinson's disease. *Movement Disorders, 22*(15), 2242-2248.
[4]Checkoway, H., Powers, K., Smith-Weller, T., Franklin, G.M., Longstreth Jr., W.T., & Swanson, P.D. (2002). Parkinson's disease risks associated with cigarette smoking, alcohol consumption, and caffeine intake. *American Journal of Epidemiology, 155*(8), 732-738.
[5]Walden, N., & Earleywine, M. (2008). How high: Quantity as a predictor of cannabis-related problems. *Harm Reduction Journal, 5*(20), doi: https://doi.org/10.1186/1477-7517-5-20.
[6]Teschke, K., Marion, S.A., Tsui, J., Harris, M.A., Marino, S., Rugbjerg, K., & Shen, H. (2011). Parkinson's Disease: Workplace Risk Factors Final Report to WorkSafeBC, (February).