Effect of Marijuana Smoking on Global Cerebral Blood Flow in Chronic and Occasional Users
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Purpose
To assess the effect of marijuana (MJ) smoking on global cerebral blood flow (gCBF) in chronic and occasional users.

Methods
Significant cardiovascular changes occur with marijuana (MJ) smoking and are associated with exposure to the main psychoactive substance, delta-9-tetrahydrocannabinol (THC). However, there are conflicting reports as to whether these peripheral vascular changes translate to central cerebrovascular changes and if so, are these effects altered by chronicity of use. Therefore, the effect of smoking MJ on gCBF (in mL/min/100 mL) was investigated using quantitative [15O]water (1665 MBq = 45 mCi/injection) positron emission tomography (PET) imaging (Siemens ECAT EXACT HR). Each subject smoked placebo and MJ cigarettes containing two different doses of THC (moderate (23.5 mg) and high (44.5 mg) for chronic MJ users; or low (13.2 mg) and moderate (23.5 mg) for occasional users). Each subject was studied on two different occasions, receiving placebo and one of the doses on one occasion, and the other dose on a separate occasion. Three measurements of gCBF were made while performing cognitive tasks for each THC dose; measurements were separated by approximately 15 minutes. gCBF measurements were analyzed by two-way repeated measures ANOVA with measurement time and dose as two different factors.

Results
For chronic users (N=6), there were non-significant main effects for dose and for measurement time. In addition, the interaction effect between dose and measurement time was found to be non-significant. A similar pattern was observed for occasional users (N=6) with non-significant findings for the main effect of dose and measurement time; and for the interaction term.

Conclusion
Consistent with our previous reported findings at a single dose (Ponto, et al., 2004) smoking marijuana, at varying dose levels of THC, has no systematic impact on gCBF across the sampled times whether an individual was a chronic or an occasional user.