

## MARIJUANA USE TAKES TOLL ON ADOLESCENT BRAIN FUNCTION, RESEARCH FINDS

*ScienceDaily (Oct. 15, 2008) — Brain imaging shows that the brains of teens that use marijuana are working harder than the brains of their peers who abstain from the drug.*

At the 2008 annual meeting of the American Academy of Pediatrics in Boston, Mass., Krista Lisdahl Medina, a University of Cincinnati assistant professor of psychology, presented collaborative research with Susan Tapert, associate professor of psychiatry at the University of California, San Diego.

Medina's Oct. 12 presentation, titled, "Neuroimaging Marijuana Use and its Effects on Cognitive Function," suggests that chronic, heavy marijuana use during adolescence – a critical period of ongoing brain development – is associated with poorer performance on thinking tasks, including slower psychomotor speed and poorer complex attention, verbal memory and planning ability. Medina says that's evident even after a month of stopping marijuana use. She says that while recent findings suggest partial recovery of verbal memory functioning within the first three weeks of adolescent abstinence from marijuana, complex attention skills continue to be affected.

"Not only are their thinking abilities worse, their brain activation to cognitive tasks is abnormal. The tasks are fairly easy, such as remembering the location of objects, and they may be able to complete the tasks, but what we see is that adolescent marijuana users are using more of their parietal and frontal cortices to complete the tasks. Their brain is working harder than it should," Medina says.

She adds that recent findings suggest females may be at increased risk for the neurocognitive consequences of marijuana use during adolescence, as studies found that teenage girls had marginally larger prefrontal cortex (PFC) volumes compared to girls who did not smoke marijuana. The larger PFC volumes were associated with poorer executive functions of the brain in these teens, such as planning, decision-making or staying focused on a task.

Medina says adolescence is a critical time of brain development and that the findings are yet another warning for adolescents who experiment with drug use. She says more study is needed to see if the thinking abilities of adolescent marijuana users improve following longer periods of abstinence from the drug. "Longitudinal studies following youth over time are needed to rule out the influence of pre-existing differences before teens begin using marijuana, and to examine whether abstinence from marijuana results in recovery of cognitive and brain functioning," says Medina.

The research was supported by the National Institute on Drug Abuse (NIDA).