

Smaller volumes in certain regions of the brain could lead to increased likelihood of drug addiction

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An article publishing online today in *Brain: A Journal of Neurology* has found that individual differences in brain structure could help to determine the risk for future drug addiction. The study found that occasional users who subsequently increased their drug use compared with those who did not, showed brain structural differences when they started using drugs.

In the two studies, researchers, led by Dr. Benjamin Becker, scanned the [brain structure](#) of 66 participants to provide the first likely evidence showing volumes of fronto-striato-limbic regions of the brain have an effect on increased drug use. In order for early intervention of addiction to be possible, the study has deemed it essential to identify the biomarkers which may make a person more vulnerable to [drug addiction](#), due to these particular areas of the brain affecting [decision making](#) and impulsivity.

In both studies the scientists scanned occasional users of amphetamine-type stimulant (ATS), such as amphetamine and ecstasy (MDMA). Participants were monitored after 12 and 24 months to assess their level of drug use after both periods of time. Those whose ATS use subsequently increased had smaller volumes in front-striato-limbic regions. Dr Becker said, "prospective longitudinal studies in occasional users are of great importance to determine biological vulnerability markers, which can help to identify individuals at greatest risk of developing an [addiction](#)."

He went on to conclude that "these findings indicate that individual differences in fronto-striato-limbic regions implicated in impulsivity and decision making could render individuals vulnerable for the transition from occasional to escalating stimulant use."

Occasional users in both studies, who increased stimulant use during the subsequent 24 months displayed smaller regional grey matter volumes compared to those who with stable or decreased use.

More information: "Smaller amygdala and medial prefrontal cortex predict escalating stimulant use" Benjamin Becker, Daniel Wagner, Philip Koester, Marc Tittgemeyer, Katja Mercer-Chalmers-Bender, René Hurlmann, Jie Zhang, Euphrosyne Gouzoulis-Mayfrank, Keith M Kendrick, Joerg Daumann. *Brain: A Journal of Neurology*, 2015.

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