

Questions and Answers on Addiction

20-year brain-imaging program reveals clues about underlying mechanisms



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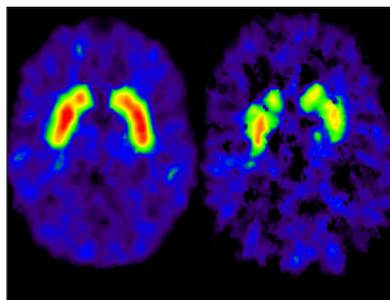
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Is addiction a disease? Yes.

Profound changes in addicts' brains are similar to — or may be worse than — changes observed in people suffering from diseases such as Parkinson's, Alzheimer's, and/or mental illness.



Brain scans reveal significant changes from methamphetamine abuse (right).

What role does the environment play in addiction?

The environment plays a crucial role in craving. Environmental cues — such as people, places, and things previously associated with taking drugs — produce significant changes in brain chemicals and are among the most important triggers of relapse.

Do all drugs of abuse work the same way?

Yes, to a certain extent. Drugs of abuse produce a marked increase in a brain chemical called dopamine. This increase has been associated with the "high" produced by all drugs of abuse.

Do all drugs of abuse damage the brain the same way?

No. Different drugs produce different changes in different brain regions. For example, changes in the brains of people addicted to methamphetamine are different from the changes in people abusing cocaine, marijuana, or alcohol.

Are these brain changes permanent?

We do not know. We have evidence that changes are still present as long as 14 months after drug use has stopped. In alcoholics we see a modest recovery in only some individuals.

Does stopping drug use prevent further damage to the brain?

It appears that people who stop abusing drugs today may prevent further damage tomorrow.

How much of a drug does someone have to abuse before brain changes occur?

We do not know. We suspect, however, that different amounts of drugs have different effects on different people. That is, some people may be more or less vulnerable

to the effects of drugs. Therefore, we may not be able to determine an amount that consistently produces changes.

Does smoking marijuana lead to abuse of "harder" drugs?

People who abuse drugs such as cocaine, heroin, and methamphetamine often start by abusing marijuana, but, a direct cause/effect relationship has not been established.

Does tobacco affect the brain?

Yes. Nicotine increases dopamine like other addictive drugs. Another component of tobacco smoke inactivates chemicals that break down dopamine. In former smokers, these chemicals are at normal levels, but we don't know how long that recovery takes. It does not occur overnight.

What should we tell our children?

All addicts start out believing they will never become hooked on any drug. This suggests that something beyond their control happens in the brain, resulting in their inability to stop. We do not know if today's drug-induced changes will result in more behavioral changes years from now.

Is there hope for treatment?

Yes. Work at Brookhaven has identified a candidate drug, which preliminary tests have found to be effective against all abused drugs. This drug, combined with behavioral therapy and a stable social structure, perhaps could lead to an effective treatment.