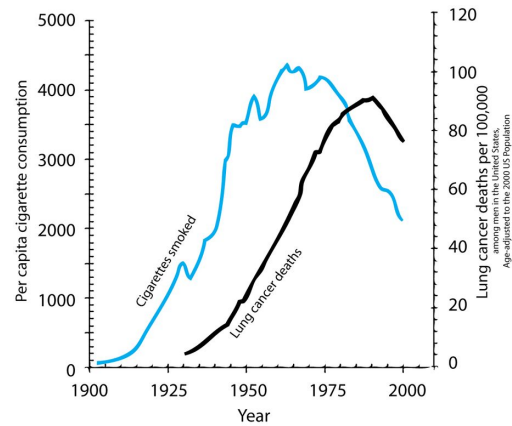


How Does Nicotine Affect Frontal Cortex Activity in Adults Compared to Adolescents?

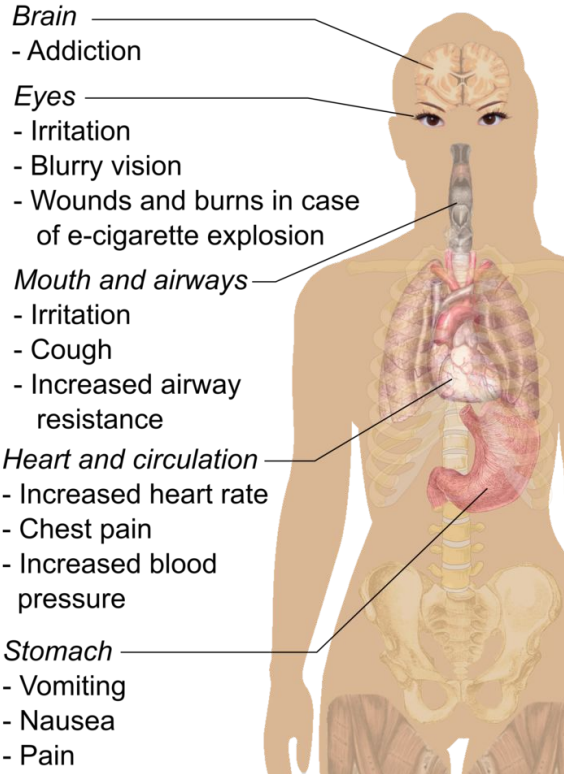
If adolescent and adult rats are each exposed to nicotine, then both groups will see similar decreases in brain activity.

Background

- Huge tobacco consumption in the US
- 480,000 deaths per year can be attributed to smoking
- Tobacco products link with nicotine
- Our study will compare brain activity of adult rats as well as adolescent rats.

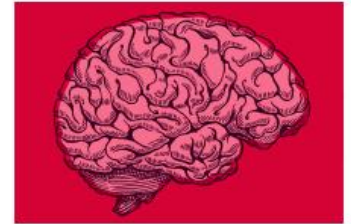


Adverse effects of vaping



Mechanistic Background

- Evaluate physical changes in the brain
- Electroencephalogram (EEG)
- Frontal cortex activity
- Nicotine vs none



Think E-Cigs Can't Harm Teens' Health?

The science says they can. The nicotine in e-cigarettes can change the young brain and get kids hooked.

- “Lasting effects of nicotine exposure on the electroencephalogram”
- Nicotine exposure → brain cell death

Experimental Design

Take initial measure of Brain Activity (EEG) in all groups

WEEK 0



Recovery week: Allow experimental rats to recover for a week. Control Group will also rest

WEEK 2



WEEK 1

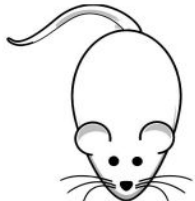
Experimental Period: In experimental group, administer 5 mg of nicotine per day. Control group doesn't get treatment

WEEK 3

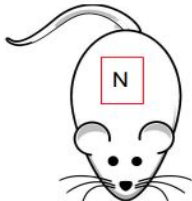
Record Final Brain Activity Measurement EEG of both groups. Compare results

Adolescent (25 days old)

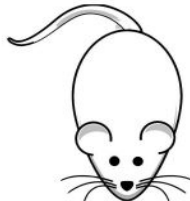
Adult (70 days old)



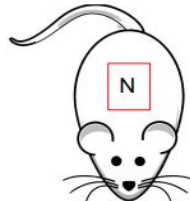
6 Males 6
Females Control



6 Males 6
Females
Experimental

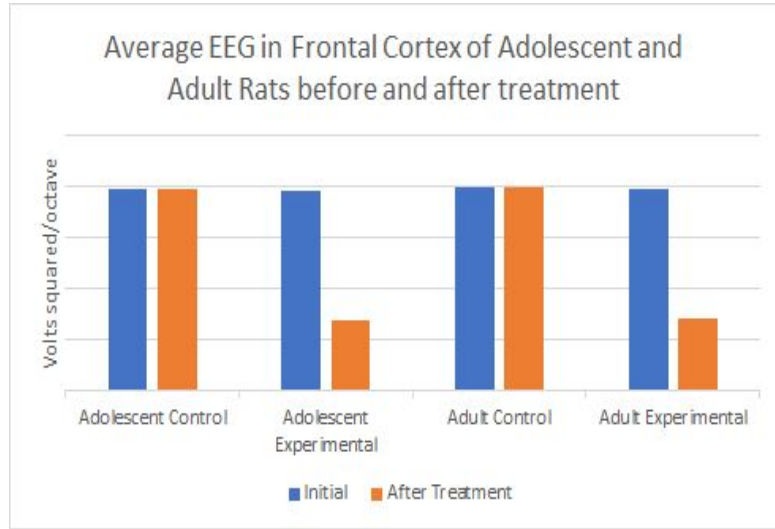


6 Males 6
Females Control

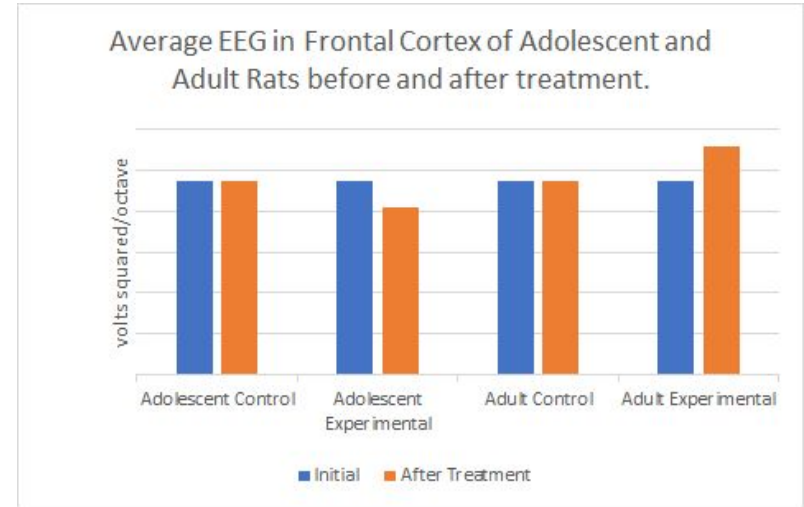


6 Males 6
Females
Experimental

Potential Results



- Similar decrease in brain activity in adult and adolescent experimental groups



- Increase in brain activity in adult experimental groups

Future Directions

- Social behavior
- Neurological disorders
- Other parts of the brain
- Different administration methods



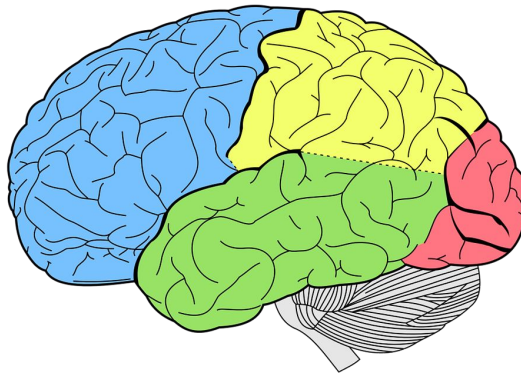
Passive



Assertive



Aggressive



References

Slawecki, Craig J, and Cindy L Ehlers. “Lasting Effects of Adolescent Nicotine Exposure on the Electroencephalogram, Event Related Potentials, and Locomotor Activity in the Rat.” *Developmental Brain Research*, vol. 138, no. 1, 2002, pp. 15–25., doi:10.1016/s0165-3806(02)00455-8.

Kumari, Veena, et al. “Cognitive Effects of Nicotine in Humans: an FMRI Study.” *NeuroImage*, vol. 19, no. 3, 2003, pp. 1002–1013., doi:10.1016/s1053-8119(03)00110-1.

Valentine, Gerald, and Mehmet Sofuoglu. “Cognitive Effects of Nicotine: Recent Progress.” *Current neuropharmacology* vol. 16,4 (2018): 403-414. doi:10.2174/1570159X15666171103152136

“Tobacco-Related Mortality.” *Centers for Disease Control and Prevention*, Centers for Disease Control and Prevention, 28 Apr. 2020,
www.cdc.gov/tobacco/data_statistics/fact_sheets/health_effects/tobacco_related_mortality/index.htm.