

Alcohol and Development during Adolescence and Early Adulthood

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Ref:

Brown et al, "Underage Alcohol Use.." Alcohol Research and Health, 32, p41 (2009)

Masten et al, "A Developmental Perspective on Underage Alcohol Use" Alcohol Research and Health, 32,p3 (2009)

Tapert et al, "Alcohol and the Adolescent Brain" Alcohol Research and Health, 28, p205 (2004/5)

Developmental Tasks and Accomplishments Reflect Rapid Changes in Cognitive Skills

■ Adolescence

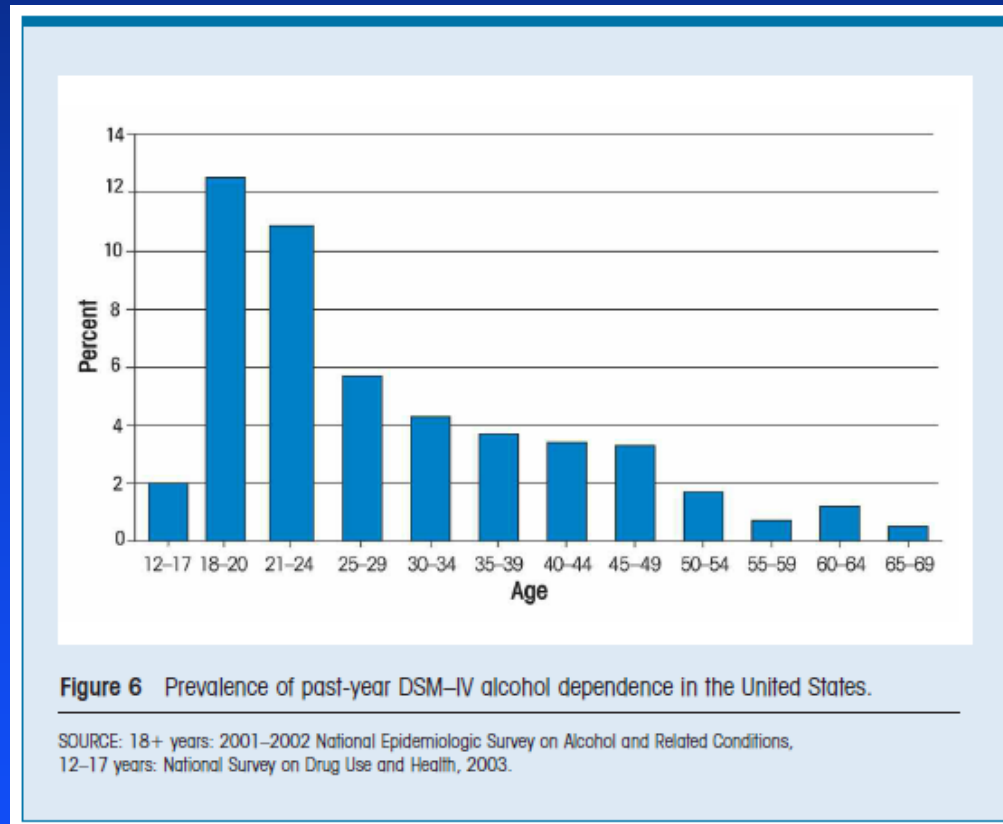
- ◆ Achieving academic success in more advanced topics
- ◆ Graduating from high school
- ◆ Making and maintaining close friends
- ◆ Learning and following the rules and laws that govern conduct in society

■ Early Adulthood

- ◆ Achieving higher education or vocational training
- ◆ Gaining employment
- ◆ Engaging in responsible sexual behavior
- ◆ Parenting effectively when one becomes a parent

Adolescent Alcohol Use as a Developmental Phenomenon

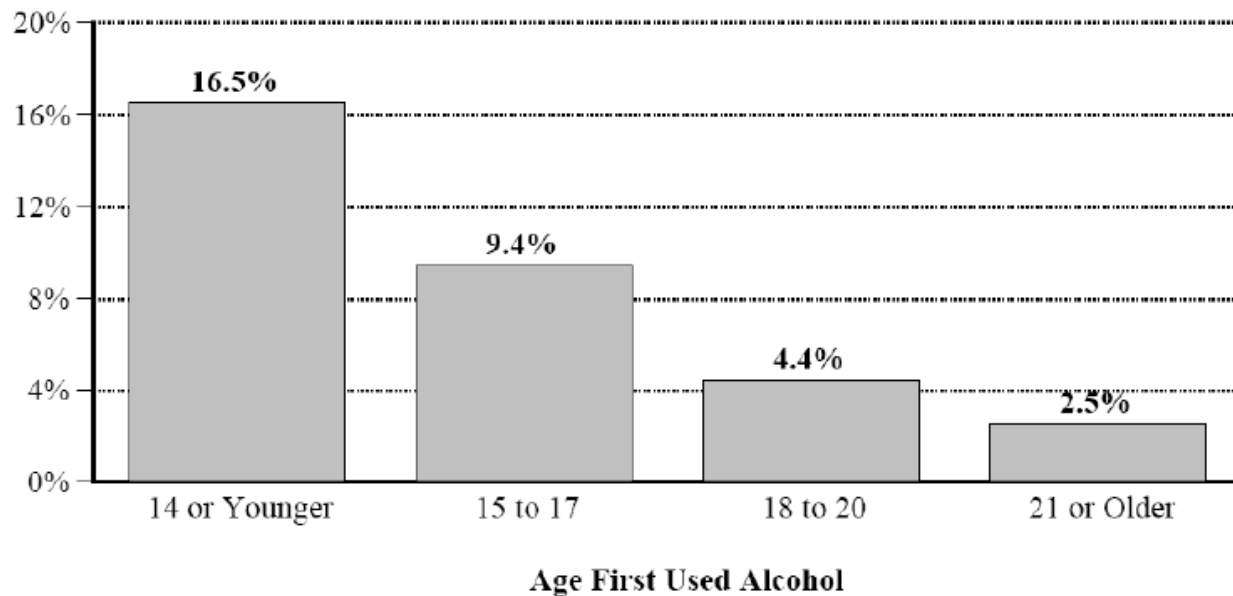
■ Prevalence of alcohol dependence by age



Adolescent Alcohol Use as a Developmental Phenomenon

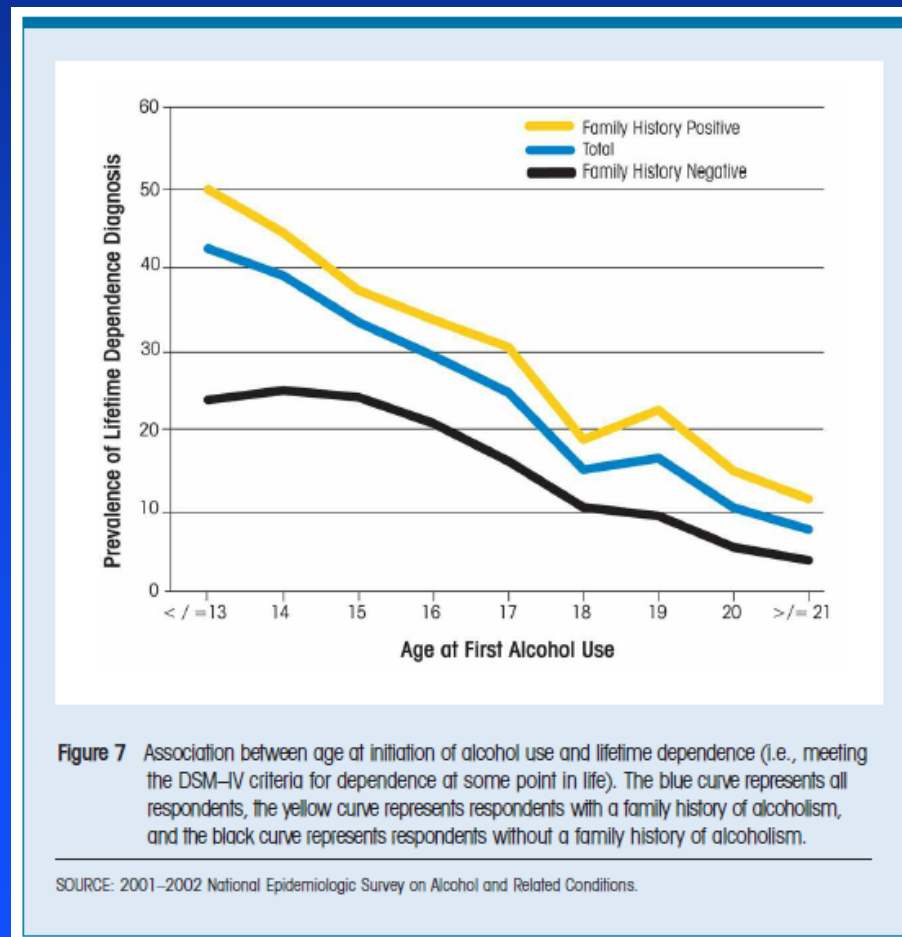
- Adult problem use and dependence highly age-of-onset dependent

Percentage of Adults (Ages 21 or Older) Who Abused or Were Dependent on Alcohol in the Past Year, by Age of First Alcohol Use, 2009



Adolescent Alcohol Use as a Developmental Phenomenon

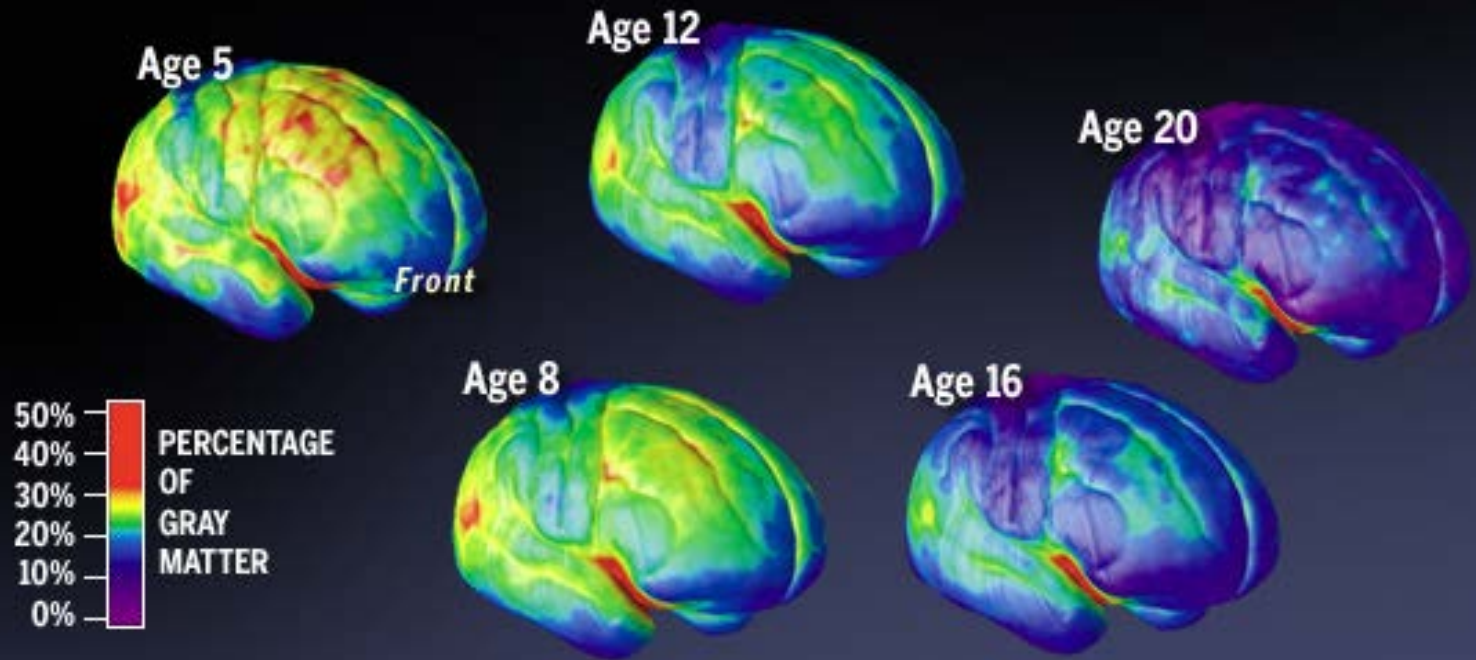
- Prevalence of Dependence Diagnosis by age of first use and family environment



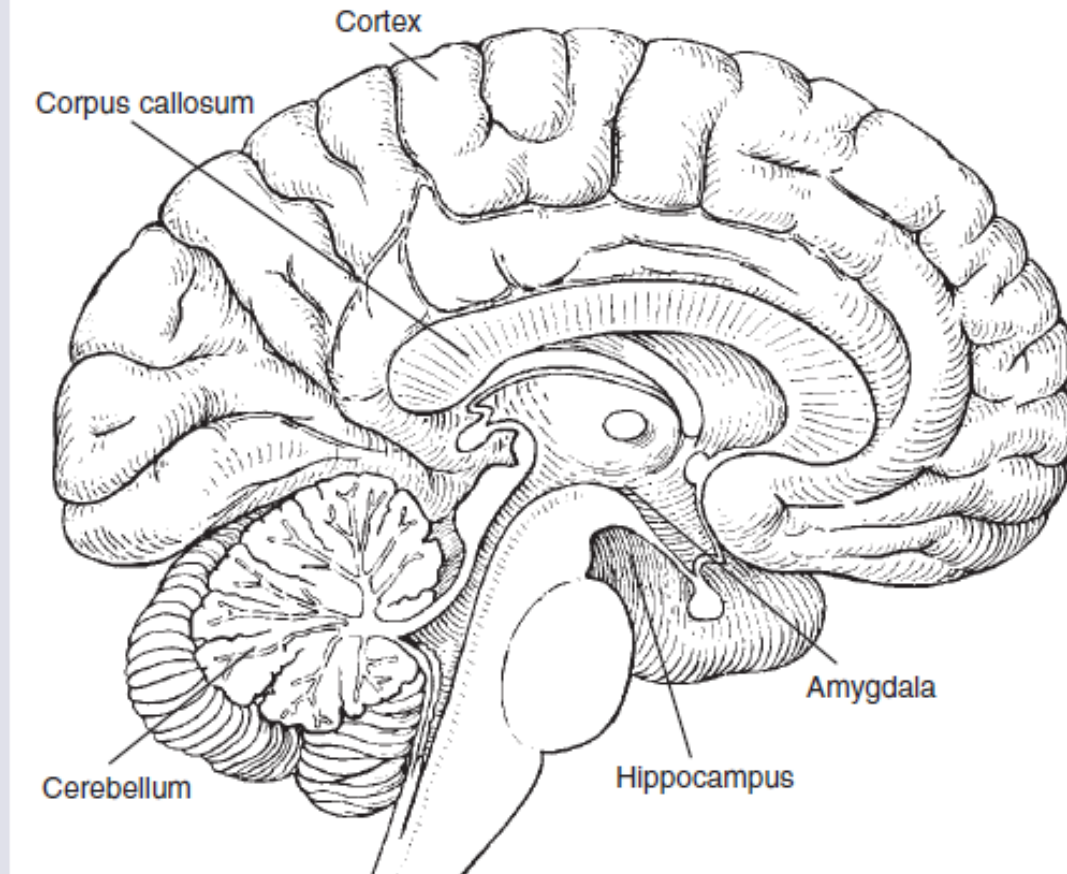
Adolescent Brain Structure Development

Time-Lapse Brain

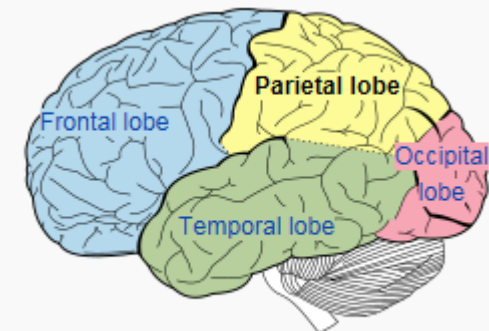
- Gray matter wanes as the brain matures. Here 15 years of brain development are compressed into five images, showing a shift from red (least mature) to blue.



Alcohol and the Adolescent Brain



Areas of the brain that may be particularly vulnerable to alcohol's effects. For example, the hippocampus, which lies deep within the cerebral hemispheres, plays an important role in learning and memory formation. Heavy drinking during adolescence can lead to reduced hippocampal volume.



Principal fissures and lobes of the cerebrum

Brain Structure and Function Affected by alcohol use in adolescents

- Hippocampus volume significantly smaller
- White matter in corpus callosum has reduced integrity
- Brain function scans during mental exercises show alterations in blood oxygen delivery to parietal, cerebellar, and frontal brain regions.
- Sensitivity to alcohol reinforcement higher in adolescents and young adults compared to adults
 - ◆ Brain maturation proceeds from the rear to the front. The prefrontal cortex controls impulse behavior