

# Neuroscience-Inspired, Behavioral Change Program for University Students



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## KEYWORDS

- Health promotion • Behavioral change • Transitional age brain development
- Critical period • Developmental mismatch

## KEY POINTS

- Transitional age youth (TAY) with their associated transitional age brains (TAB) are at high risk for negative health outcomes, high rates of psychiatric illness, suicide attempts, and morbidity and mortality.
- In the context of the TAB, the high-risk living environments sometimes found in college combined with little or no external regulatory support are associated in some cases with profoundly negative statistics on alcohol and drug use, emotional behavioral health, and perhaps low 6-year graduation rates.
- These statistics led to the design, development, and implementation of a neuroscience-inspired, incentivized behavioral change program at the University of Vermont called the Wellness Environment (WE).
- WE argues that the prescription of an incentive-based, behavioral change, contingency management program with brain-building activities simply makes good scientific, programmatic, and financial sense for colleges and universities as they attempt to support TAY to graduation.

## TRANSITIONAL AGE BRAIN GOES TO COLLEGE: WHY THIS IS A PERFECT STORM

In this issue, Chung and Hudziak describe the process of neurodevelopment during the transitional age brain (TAB) epoch and summarize the argument that because of the neurodevelopmental mismatch of different parts of the brain, TAY are at high risk for engaging in behaviors that can lead to negative outcomes, morbidity, and mortality. As conveyed in the article by Winston W. Chung and James J. Hudziak,

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“The Transitional Age Brain: The Best of Times and the Worst of Times,” in this issue, the central hypothesis is that the TAB has fully matured risk-taking hardware (because of early maturation of subcortical brain regions amygdalae, nucleus accumbens, and so forth) but not yet matured regulatory hardware (prefrontal cortical regions). The early years (13–17) of the TAB epoch occur within the context of external structure provided by parents, other family members as well as educational institutions and other social structures. Thus, some of the high-risk behavior of early TAY is moderated by parental rules and expectations. These external controls and expectations do not completely negate the risk for morbidity and mortality associated with suicide, substance use and misuse, psychiatric illness, and accidents in TAY.

In almost every measurable domain, adolescence is a developmental period of strength and resilience. The aim of this article is to draw added attention to the special case of why the student with a TAB at college represents a perfect storm; novelty, risk, stress, pressure, substance use and substance abuse are present at the same time the external regulatory system (parents and others) has been removed. The authors focus on the potential outcome when there is an intersection between the high rates and easy access to alcohol and drugs, high-risk social and living environments, and the lack of supervision and regulatory support at a critical period of neurodevelopment in which the regulatory regions of the brain are going through the critical process of maturation (pruning). The authors end by presenting one possible model solution to this critical problem: the prescription of a neuroscience-inspired, incentivized behavioral change program developed at the University of Vermont (UVM).

### **TRANSITIONAL AGE BRAIN GOES TO COLLEGE: THE FACTS**

The TAB, and the resultant thoughts, actions, and behaviors of the TAY, represents one key to understanding the causal relations to the spike in morbidity and mortality in this age group. Where is the evidence? Recent evidence of the rates and consequences of high-risk alcohol and drug use, accidents, and psychiatric illness is presented in the context of the TAB.

About 1 in 4 college students report academic consequences from drinking, including missing class, falling behind in class, doing poorly on examinations or papers, and receiving lower grades overall. Furthermore, about 20% of college students meet the criteria for an alcohol use disorder (AUD). Drinking often causes inappropriate or impulsive behavior among college students. Approximately 900,000 students are injured simply because of being intoxicated. About 696,000 students between the ages of 18 and 24 are assaulted by another student who has been drinking. About 97,000 students between the ages of 18 and 24 report experiencing alcohol-related sexual assault or date rape.<sup>1</sup> A full 28.5% of female students reported having experienced an attempted or completed sexual assault either before or since entering college.<sup>2</sup> As mentioned earlier, suicide and depression are strongly emerging in adolescence.

Suicide is the second-leading cause of death among 20 to 24 year olds, and 1 in 12 US college students makes a suicide plan. More teenagers and young adults die from suicide than from all medical illnesses combined. This period is also notable for the high rates of accidents and health problems related to risky sexual behaviors.<sup>3</sup> In addition, adolescence is the peak time of emergence for several types of mental illnesses, including anxiety disorders, bipolar disorder, depression, eating disorders, psychosis, and substance abuse. As reported in the National Comorbidity Survey

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