



# Adolescent Brain Cognitive Development

*Teen Brains. Today's Science. Brighter Future.*

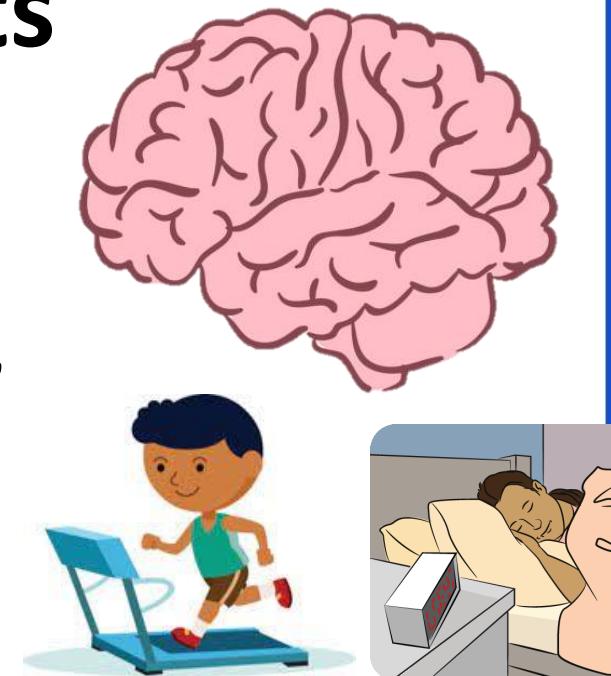
## Adolescent Substance Use

Prevention & Treatment

Krista Lisdahl, Ph.D., UW-Milwaukee

# Adolescence is a Gateway

- Adolescence is a **gateway** to establishing **health patterns for decades**
- Brain has “**neuroplasticity**” and **executive function, emotion regulation improves, habits formed often last into adulthood**
  - Sleep, physical activity, nutrition, coping styles, relationship patterns, mental health management, **substance use attitudes and behaviors**
- **Golden opportunity to bolster resilience – prevention is best & treat problems early!**



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# Reducing Teen Drug Use: *Modifiable Factors*



- **Parenting Factors**

- ↑ **authoritative parenting style** (warm, responsive, and thoughtful discipline and guidance)
- ↑ **parental monitoring** (asking where kids are, who they are with, knowing friends, check intoxication)
- ↑ **family routines** (e.g., mealtimes, outdoor activities, predictable schedules)
- ↓ **parental, older sibling drug/alcohol use** (<7  <14)
- ↓ **access to drugs/alc** in neighborhood & home (locked cabinets, out of view)
- ↑ **family rules** prohibiting drugs/alc use in teens
- ↓ **Adverse Childhood Experiences** (family conflict, neglect, abuse, parental SUD/MH, parent absence, disasters, witness crime)

- **Teen/Peer Factors**

- ↑ **mental health, executive function, memory**
- ↑ **total sleep time** (8-10 hours, 3:10 problems)
- ↓ **friends who use drugs/alc**; ↑ **positive social involvement**
- ↑ **practiced early drink refusal skills**
- **School & Community factors**
- ↑ **school rules prohibiting alc/drug use**
- ↑ **pos feelings of school involvement & support**
- ↑ **school and neighborhood safety**
- ↑ **spirituality, pro-social involvement**
- ↑ **access to mental health screening/treatment**



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# Signs of Teen Alc/Drug Problems

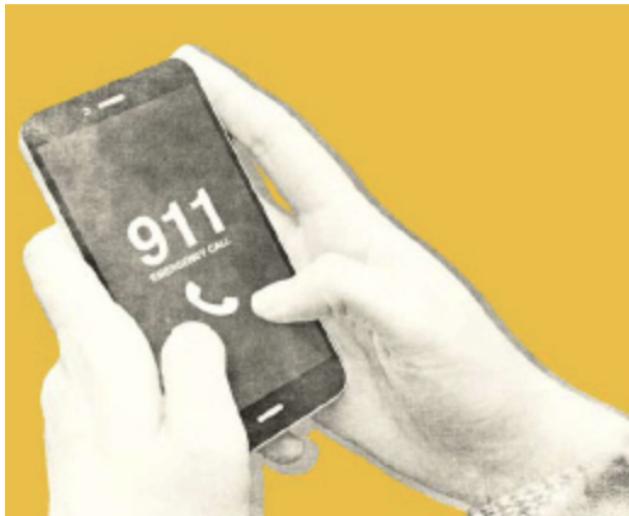
- **Addiction can happen in teen/YA years:**
  - Using a drug even though it's harming your health or life (relationships, school)
  - Missing out on or quitting activities due to drugs or alcohol
  - Using more of alcohol or drugs to get same effect; Blacking out; having withdrawal or hangovers; craving or thinking about the drug often
  - Trying to cut back or quit, but having trouble
- **Other Warning signs can include:**
  - Not caring about your appearance
  - Changing friends because of your drug/alcohol use
  - Getting in trouble in school or with the law
  - Having different eating or sleeping habits
- **Screenings are available! <https://nida.nih.gov/bstad>**



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# Overdose Prevention/Treatment



## If Someone is Overdosing on Drugs or Alcohol: ACT QUICKLY!

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Overdose is a dangerous result of drug or alcohol use that happens when someone takes enough of the drug or alcohol for it to reach toxic levels, causing a serious reaction to the body such as changing heart rate, temperature, or stopping someone's breathing.



- If you believe someone is overdosing or in danger after using drugs or alcohol, immediately call 911 for medical attention. Do NOT leave the intoxicated person alone.
- If known, tell the emergency responders what the person took and how much they had. If known, provide any other health information such as medications they take.
- Keep the person on the ground in a sitting or partially upright position to prevent falls. **Help a person who is vomiting:** have them lean forward to prevent choking. If they are unconscious or lying down, roll them onto one side with an ear towards the ground to prevent choking.
- If someone has taken an **opioid, heroin, or prescription pain reliever** and is showing signs of an overdose, naloxone as a nasal spray (Narcan) or through an injection (Enzio) can reverse the effects of the drug.

<https://abcdstudy.org/youth-resources/>

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# Teen Substance Use Disorder Treatment

- You do not need to wait for “rock bottom” or severe problems! Treatment before 18 may allow more parental involvement
- Top Research Supported Treatments for Teens/Young Adults: [Treatment Works!](#)
  - Family-based Therapy, Cognitive Behavioral Therapy
  - Motivational Enhancement Therapy, Contingency Management, Mindfulness-Based Cognitive Therapy
- May Assist (partial evidence for reducing use)
  - Feedback on \$\$ spent and effects on health and appearance
  - 12-step peer-based programs or Recovery education high school
  - Health apps; Exercise, yoga, meditation ([brain-boosters!](#))
  - Opioid assisted medications or nicotine replacement (young adults)



**SAMHSA National Helpline:**

**1-800-662-HELP (4357); <https://findtreatment.gov/>**

**NIAAA: Alcohol Treatment:**

**<https://alcoholtreatment.niaaa.nih.gov/>**



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# Thank you, ABCD participants and families!



**UWM BraIN Lab: Faculty:** Drs. Chris Larson, Andrew Nencka (MCW); **Grad Students:** Julia Harris, Gabriella Navarro, Chase Shankula, Kyle Baacke, Caylin Faria; **Grad Alums:** Drs. Claudia Padula, Jenessa Price, Skyler Shollenbarger, Tasha Wade, Kristin Maple, Alicia Thomas, Kyle Jennette, Megan Ritchay, Alex Wallace, Kaitlynne LeClaire, Ryan Sullivan, Ashley Stinson. **Staff/Students:** Caitlin Nelson, Erick Bernal, Zachary Paltzer, Hailley Moore, Bo Malames, Clem Schumacher, Vivien Blecking, Sabrina Arassi, Isabelle Wilson, Tierel Hood-Nellum, Kenya Guadalupe Cendejas, Miranda Paltzer, Nada Fouad Abduljalil, Joshua Roesel. **Funding:** NIH (U01DA041025, MPI: Lisdahl, Larson).



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# Extra slides



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# Building Healthy Teen Habits



- **Boost Brain/Cognition:**

- **staying in school** helps build cognitive reserve
- **↑ physical activity** ~ **↑ executive functioning, memory**
- **no/mild caffeine** ~ **↑ executive functioning**
- **longer sleep** ~ **↑ brain volume in frontal and temporal cortex, ↑ concentration, ↓ MH problems (sad, anxious, impulsive)**
- **↑ video game** ~ **↑ problem solving, flexible thinking, memory**
  - *Caveat:* mature-related content ~ reduced sleep & greater problem behaviors; 2-3 hours max

## Video gaming

- ✚ Problem-solving
- ✚ Flexible thinking
- ✚ Recalling facts & skills

## Social media

- ✚ Problem-solving



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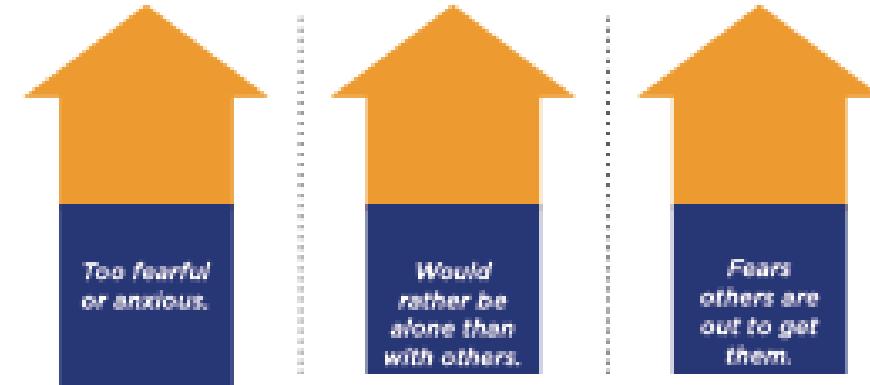
# Building Healthy Teen Habits

## Promoting General Mental Health/Emotion Resilience:

- ↑ **social support, pro-active coping, warm parental relations**
- ↑ **total sleep time (8-10 hours!)**
- ↑ **pro social and physical activities**
- ↑ **school and neighborhood community connections**
- ↑ **green space access** (e.g., parks, community gardens)
- ↓ screen time (especially **social media/cyberbullying**)
- ↓ **parental alcohol or drug use**
- ↑ **family routines** (e.g., regular mealtimes, outdoor activities)
- ↓ **Adverse Childhood Experiences** (neglect, abuse, parental SUD/MH, prolonged absence from parents)
- ↑ **screening and early treatment, including suicide prevention, especially in school and pediatric settings**



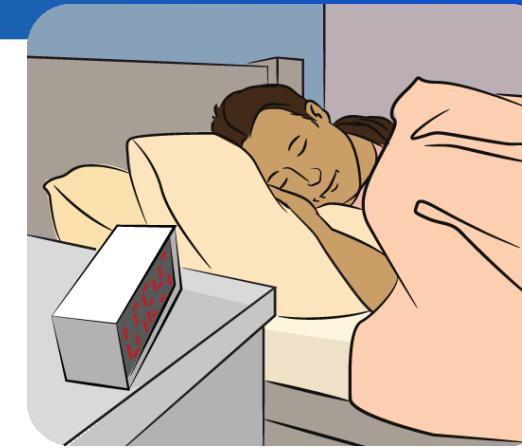
⌚ Together, more video watching and less sleep were related to small increases in:



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# Building Healthy Teen Habits

- **Sleep: 8-10 hours/day**
  - **3:10 teens have difficulty sleeping!**
    - Motive to use alcohol, cannabis ~ fall asleep
    - Motive to use caffeine, nicotine, stimulants ~ stay awake
  - **Routine bedtime, dark/cool room, limit stimulants (i.e., caffeine), limit screen time (2-3 hours/day), keep naps short (15-20 mins), keep bedroom for sleep, no screen hour before bed**
  - **Get sunlight and physical activity during day**
  - **If sleepwalking, night terrors, snoring, excessive daytime sleepiness -> get screened by physician**



## What influences how long and how well youth sleep?



**Recreational screen activities**, such as watching TV or videos, playing video games, texting, or using social media



**Drinking beverages with caffeine**



**Negative childhood experiences**, such as experiencing or witnessing violence or abuse, or living in unsafe or unstable environments



**Perceived threat** (e.g., crime, conflict) in the neighborhood, at school, or in the family



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# Parents: Modeling Healthy Habits

- If parent/guardian drink alcohol, try to **limit to lower-risk levels** (see below)
- **Treat substance use problems** in the household and have open conversations
- Make **clear rules** that **prohibit teenage substance use** ~ allowing early use linked with greater odds of drinking by 9<sup>th</sup> grade, binge drinking in high school, and early SUD
- Be mindful about **older sibling use & providing substances**; be careful where you **store substances** (locked cabinets preferred)
- **Monitor youth** (check-in about school progress, get to know their friends, ask where they are going, who they are spending time with, have them check-in when return home, look for signs of intoxication or substance use). Note: over-surveillance or over-helping backfires as youth transition into late adolescence/young adulthood. Parental transition into “autonomy-supportive” warm guidance.



# Treating Nicotine Addiction

- Teens who **vape** are **more likely** to transition to **use** other tobacco products (e.g., cigarettes, chewing tobacco)
- **Effective treatments**
  - Behavioral therapies like **cognitive behavioral therapy (CBT)**, **motivational therapy**, **contingency management**
  - *May assist:* App-based quitting programs, **supportive social media**, feedback on **\$\$ spent** and **effects on health and appearance**
  - FDA-approved medications approved for **adults**: Bupropion (Zyban<sup>®</sup>), Varenicline (Chantix<sup>®</sup>), and nicotine replacement therapy products (gum, patches, sprays, inhalers, and lozenges) with use reduction plan



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