Growing a Grown-up Brain

Scientists have long thought that the human brain was formed in early childhood. But by scanning children’s brains with an MRI year after year, they discovered that the brain undergoes radical changes in adolescence. Excess gray matter is pruned out, making brain connections more specialized and efficient. The parts of the brain that control physical movement, vision, and the senses mature first, while the regions in the front that control higher thinking don’t finish the pruning process until the early 20s.

Gray matter density

Gray matter becomes less dense as the brain matures.

More dense | Less dense

Age: 5 | Adolescence | 20

Brain Development

Volume
Metabolism
Myelination
Blood Flow
Receptors
Synaptic Refinement

Prenatal  1  2  7  16  30  Post-birth Age

Rate of Change

Source: Tapert & Schweinsburg, 2005
Synaptic Refinement
Myelination
Dopamine Receptors
Dopamine Receptors
This is Normal Development

Act First, Think Later

More Risky Impulsive Behavior

Preference for Physical Activity and Sensation Seeking

Emotions Felt Very Intensely

Less than Optimal Planning

Less Consideration of Negative Consequences

Strongly Influenced by Friends and Peers
Eat, Drink, Connect
Brain Changes

The brain undergoes changes throughout life (Eriksson et al., 1998), with intervals of modest change punctuated by periods of more rapid transformation (Spear, 2000). Periods of more dramatic change include not only pre- and early postnatal eras but also adolescence (Spear, 2000). Rakic, Bourgeois, and Goldman-Rakic (1994) estimate that up to 30,000 cortical synapses are lost every second during portions of the pubertal period in nonhuman primates, resulting in a decline of nearly 50% in the average number of synaptic contacts per neuron, compared with the number prior to puberty. There is a similar loss of synapses in the human brain between 7 and 16 years of age (Huttenlocher, 1979), but the scarcity of human postmortem tissue makes it difficult to provide a more detailed description of this phenomenon. Although the implications of the massive pruning remain speculative, it is likely that it reflects active restructuring of connections and the promotion of more mature patterns. Some forms of mental retardation are associated with unusually high density of synapses (Goldman-Rakic, Isseroff, Schwartz, & Bugbee, 1983).
Dopamine Pathways

Functions
- Reward (motivation)
- Pleasure, euphoria
- Motor function (fine tuning)
- Compulsion
- Perseveration

Serotonin Pathways

Functions
- Mood
- Memory processing
- Sleep
- Cognition
it is sad today.
How Heroin Works
Dopamine Receptors
Early Use + Genetics + Trauma
Addiction is a Developmental Pediatric Disease

Source: NIAAA National Epidemiologic Survey on Alcohol and Related Conditions, 2003
Teen Alcohol Use Wires The Brain For Addiction

40% of kids who begin drinking at age 15 will become alcoholics.

Only 7% of those who begin drinking at age 21 become alcoholics.

* Photo courtesy of NIAAA and MADD
Genetics Account for 50% of Risk of Addiction
Adverse Childhood Experiences
Emotional Neglect
Abuse
Household Dysfunction
Relationship of Childhood Abuse and Household Dysfunction to Many of the Leading Causes of Death in Adults

The Adverse Childhood Experiences (ACE) Study

Vincent J. Felitti, MD, FACP, Robert F. Anda, MD, MS, Dale Nordenberg, MD, David F. Williamson, MS, PhD, Alison M. Spitz, MS, MPH, Valerie Edwards, BA, Mary P. Koss, PhD, James S. Marks, MD, MPH

Background: The relationship of health risk behavior and disease in adulthood to the breadth of exposure to childhood emotional, physical, or sexual abuse, and household dysfunction during childhood has not previously been described.

Methods: A questionnaire about adverse childhood experiences was mailed to 13,494 adults who had completed a standardized medical evaluation at a large HMO; 9,508 (70.5%) responded. Seven categories of adverse childhood experiences were studied: psychological, physical, or sexual abuse; violence against mother; or living with household members who were substance abusers, mentally ill, suicidal, or ever imprisoned. The number of categories of these adverse childhood experiences was then compared to measures of adult risk behavior, health status, and disease. Logistic regression was used to adjust for effects of demographic factors on the association between the cumulative number of categories of childhood exposures (range: 0–7) and risk factors for the leading causes of death in adult life.

Results: More than half of respondents reported at least one, and one-fourth reported ≥2 categories of childhood exposures. We found a graded relationship between the number of categories of childhood exposure and each of the adult health risk behaviors and diseases that were studied ($P < .001$). Persons who had experienced four or more categories of childhood exposure, compared to those who had experienced none, had 4- to 12-fold increased health risks for alcoholism, drug abuse, depression, and suicide attempts; a 2- to 4-fold increase in smoking, poor self-rated health, ≥50 sexual intercourse partners, and sexually transmitted disease; and a 1.4- to 1.6-fold increase in physical inactivity and severe obesity. The number of categories of adverse childhood exposures showed a graded relationship to the presence of adult diseases including ischemic heart disease, cancer, chronic lung disease, skeletal fractures, and liver disease. The seven categories of adverse childhood experiences were strongly interrelated and persons with multiple categories of childhood exposure were likely to have multiple health risk factors later in life.

Conclusions: We found a strong graded relationship between the breadth of exposure to abuse or household dysfunction during childhood and multiple risk factors for several of the leading causes of death in adults.

Finding Your ACE Score

While you were growing up, during your first 18 years of life:

1. Did a parent or other adult in the household often or very often...
   Swear at you, insult you, put you down, or humiliate you?
   or
   Act in a way that made you afraid that you might be physically hurt?
   Yes  No  If yes enter 1

2. Did a parent or other adult in the household often or very often...
   Push, grab, slap, or throw something at you?
   or
   Ever hit you so hard that you had marks or were injured?
   Yes  No  If yes enter 1

3. Did an adult or person at least 5 years older than you ever...
   Touch or fondle you or have you touch their body in a sexual way?
   or
   Attempt or actually have oral, anal, or vaginal intercourse with you?
   Yes  No  If yes enter 1

4. Did you often or very often feel that...
   No one in your family loved you or thought you were important or special?
   or
   Your family didn’t look out for each other, feel close to each other, or support each other?
   Yes  No  If yes enter 1

5. Did you often or very often feel that...
   You didn’t have enough to eat, had to wear dirty clothes, and had no one to protect you?
   or
   Your parents were too drunk or high to take care of you or take you to the doctor if you needed it?
   Yes  No  If yes enter 1

6. Were your parents ever separated or divorced?
   Yes  No  If yes enter 1

7. Was your mother or stepmother:
   Often or very often pushed, grabbed, slapped, or had something thrown at her?
   or
   Sometimes, often, or very often kicked, bitten, hit with a fist, or hit with something hard?
   or
   Ever repeatedly hit at least a few minutes or threatened with a gun or knife?
   Yes  No  If yes enter 1

8. Did you live with anyone who was a problem drinker or alcoholic or who used street drugs?
   Yes  No  If yes enter 1

9. Was a household member depressed or mentally ill, or did a household member attempt suicide?
   Yes  No  If yes enter 1

10. Did a household member go to prison?
    Yes  No  If yes enter 1

Now add up your “Yes” answers: _______ This is your ACE Score.
Three Types of ACEs

**ABUSE**
- Physical
- Emotional
- Sexual

**NEGLECT**
- Physical
- Emotional

**HOUSEHOLD DYSFUNCTION**
- Mental Illness
- Incarcerated Relative
- Mother treated violently
- Substance Abuse
- Divorce
<table>
<thead>
<tr>
<th>Category of childhood exposure</th>
<th>Prevalence (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Abuse by category</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Psychological</strong></td>
<td>11.1</td>
</tr>
<tr>
<td><em>(Did a parent or other adult in the household...)</em></td>
<td></td>
</tr>
<tr>
<td>Often or very often swear at, insult, or put you down?</td>
<td>10.0</td>
</tr>
<tr>
<td>Often or very often act in a way that made you afraid that you would be physically hurt?</td>
<td>4.8</td>
</tr>
<tr>
<td><strong>Physical</strong></td>
<td>10.8</td>
</tr>
<tr>
<td><em>(Did a parent or other adult in the household...)</em></td>
<td></td>
</tr>
<tr>
<td>Often or very often push, grab, shove, or slap you?</td>
<td>4.9</td>
</tr>
<tr>
<td>Often or very often hit you so hard that you had marks or were injured?</td>
<td>9.6</td>
</tr>
<tr>
<td><strong>Sexual</strong></td>
<td>22.0</td>
</tr>
<tr>
<td><em>(Did an adult or person at least 5 years older ever...)</em></td>
<td></td>
</tr>
<tr>
<td>Touch or fondle you in a sexual way?</td>
<td>19.3</td>
</tr>
<tr>
<td>Have you touched their body in a sexual way?</td>
<td>8.7</td>
</tr>
<tr>
<td>Attempt oral, anal, or vaginal intercourse with you?</td>
<td>8.9</td>
</tr>
<tr>
<td>Actually have oral, anal, or vaginal intercourse with you?</td>
<td>6.9</td>
</tr>
<tr>
<td><strong>Household dysfunction by category</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Substance abuse</strong></td>
<td>25.6</td>
</tr>
<tr>
<td>Live with anyone who was a problem drinker or alcoholic?</td>
<td>23.5</td>
</tr>
<tr>
<td>Live with anyone who used street drugs?</td>
<td>4.9</td>
</tr>
<tr>
<td><strong>Mental illness</strong></td>
<td>18.8</td>
</tr>
<tr>
<td>Was a household member depressed or mentally ill?</td>
<td>17.5</td>
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<tr>
<td>Did a household member attempt suicide?</td>
<td>4.0</td>
</tr>
<tr>
<td><strong>Mother treated violently</strong></td>
<td>12.5</td>
</tr>
<tr>
<td><em>(Was your mother (or stepmother)</em></td>
<td></td>
</tr>
<tr>
<td>Sometimes, often, or very often pushed, grabbed, slapped, or had something thrown at her?</td>
<td>11.9</td>
</tr>
<tr>
<td>Sometimes, often, or very often kicked, bitten, hit with a fist, or hit with something hard?</td>
<td>6.3</td>
</tr>
<tr>
<td>Ever repeatedly hit over at least a few minutes?</td>
<td>6.6</td>
</tr>
<tr>
<td>Ever threatened with, or hurt by, a knife or gun?</td>
<td>3.0</td>
</tr>
<tr>
<td><strong>Criminal behavior in household</strong></td>
<td></td>
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<tr>
<td>Did a household member go to prison?</td>
<td>3.4</td>
</tr>
<tr>
<td>Any category reported</td>
<td><strong>52.1%</strong></td>
</tr>
</tbody>
</table>

*An exposure to one or more items listed under the set of questions for each category.*
Major Findings

Childhood abuse, neglect, and exposure to other traumatic stressors which we term adverse childhood experiences (ACE) are common. Almost two-thirds of our study participants reported at least one ACE, and more than one of five reported three or more ACE. The short- and long-term outcomes of these childhood exposures include a multitude of health and social problems.

The ACE Study uses the ACE Score, which is a total count of the number of ACEs reported by respondents. The ACE Score is used to assess the total amount of stress during childhood and has demonstrated that as the number of ACE increase, the risk for the following health problems increases in a strong and graded fashion:

- Alcoholism and alcohol abuse
- Chronic obstructive pulmonary disease (COPD)
- Depression
- Fetal death
- Health-related quality of life
- Illicit drug use
- Ischemic heart disease (IHD)
- Liver disease
- Risk for intimate partner violence
- Multiple sexual partners
- Sexually transmitted diseases (STDs)
- Smoking
- Suicide attempts
- Unintended pregnancies
- Early initiation of smoking
- Early initiation of sexual activity
- Adolescent pregnancy
FREEZE & SURRENDER  Fight or Flight
Complex Childhood Trauma

Behaviors

- Aggression
- Disproportionate Reactiveness
- Impulsivity
- Distractibility
- Withdrawal and Avoidance

Three or More Traumatic Events

- Two-and-half times more likely to repeat a grade than are children who have experienced none
- Five times more likely to have severe attendance issues
- Six times more likely to experience behavioral problems
- More than twice as likely to be suspended from school
<table>
<thead>
<tr>
<th></th>
<th>No adverse family experiences</th>
<th>One adverse family experience</th>
<th>Two or more adverse family experiences</th>
<th>Total %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nationwide</td>
<td></td>
<td></td>
<td></td>
<td>100.0</td>
</tr>
<tr>
<td>%</td>
<td>52.1</td>
<td>25.3</td>
<td>22.6</td>
<td>100.0</td>
</tr>
<tr>
<td>C.I.</td>
<td>(51.3 - 52.8)</td>
<td>(24.7 - 26.0)</td>
<td>(22.0 - 23.2)</td>
<td></td>
</tr>
<tr>
<td>n</td>
<td>53,528</td>
<td>21,877</td>
<td>19,115</td>
<td></td>
</tr>
<tr>
<td>Pop. Est.</td>
<td>37,833,101</td>
<td>18,395,284</td>
<td>16,430,694</td>
<td></td>
</tr>
<tr>
<td>Massachusetts</td>
<td></td>
<td></td>
<td></td>
<td>100.0</td>
</tr>
<tr>
<td>%</td>
<td>57.2</td>
<td>22.7</td>
<td>20.2</td>
<td>100.0</td>
</tr>
<tr>
<td>C.I.</td>
<td>(54.1 - 60.2)</td>
<td>(20.0 - 25.3)</td>
<td>(17.6 - 22.7)</td>
<td></td>
</tr>
<tr>
<td>n</td>
<td>1,175</td>
<td>363</td>
<td>298</td>
<td></td>
</tr>
<tr>
<td>Pop. Est.</td>
<td>783,536</td>
<td>310,450</td>
<td>276,113</td>
<td></td>
</tr>
</tbody>
</table>

C.I. = 95% Confidence Interval. Percentages are weighted to population characteristics. n = Cell size. Use caution in interpreting Cell sizes less than 50.
Adverse family experiences
Children age 0-17 years
Nationwide vs. Massachusetts

No adverse family experiences:
- Nationwide: 52.1%
- Massachusetts: 57.2%

One adverse family experience:
- Nationwide: 25.3%
- Massachusetts: 22.7%

Two or more adverse family experiences:
- Nationwide: 22.6%
- Massachusetts: 20.2%
Adverse Childhood Experiences
Percent of children who have had two or more adverse childhood experiences

2011/12 National Survey of Children’s Health

**Nationwide:** 22.6% of children met indicator
**Range Across States:** 16.3% to 32.9%
Repeating a Grade
Percent of children who have repeated at least one grade (age 6-17)

2011/12 National Survey of Children’s Health

Nationwide: 9.1% of children met indicator
Range Across States: 2.9% to 23.0%
Top Drugs among 8th and 12th Graders, Past Year Use

8th Graders

<table>
<thead>
<tr>
<th>Drug</th>
<th>Illicit drugs</th>
<th>Pharmaceutical</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marijuana/Hashish</td>
<td>11.7%</td>
<td></td>
</tr>
<tr>
<td>Inhalants</td>
<td>5.3%</td>
<td></td>
</tr>
<tr>
<td>Synthetic Marijuana</td>
<td>3.3%</td>
<td></td>
</tr>
<tr>
<td>Cough Medicine</td>
<td>2.0%</td>
<td></td>
</tr>
<tr>
<td>Tranquilizers</td>
<td>1.7%</td>
<td></td>
</tr>
<tr>
<td>Adderall</td>
<td>1.3%</td>
<td></td>
</tr>
<tr>
<td>Hallucinogens</td>
<td>1.3%</td>
<td></td>
</tr>
<tr>
<td>OxyContin</td>
<td>1.0%</td>
<td></td>
</tr>
<tr>
<td>Vicodin</td>
<td>1.0%</td>
<td></td>
</tr>
<tr>
<td>Cocaine (any form)</td>
<td>1.0%</td>
<td></td>
</tr>
<tr>
<td>MDMA (Ecstasy)</td>
<td>0.9%</td>
<td></td>
</tr>
<tr>
<td>Ritalin</td>
<td>0.9%</td>
<td></td>
</tr>
</tbody>
</table>

12th Graders

<table>
<thead>
<tr>
<th>Drug</th>
<th>Illicit drugs</th>
<th>Pharmaceutical</th>
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</thead>
<tbody>
<tr>
<td>Marijuana/Hashish</td>
<td>35.1%</td>
<td></td>
</tr>
<tr>
<td>Adderall</td>
<td>6.8%</td>
<td>6.8%</td>
</tr>
<tr>
<td>Synthetic Marijuana</td>
<td>5.8%</td>
<td>5.8%</td>
</tr>
<tr>
<td>Vicodin</td>
<td>4.8%</td>
<td>4.8%</td>
</tr>
<tr>
<td>Tranquilizers</td>
<td>4.7%</td>
<td>4.7%</td>
</tr>
<tr>
<td>Cough Medicine</td>
<td>4.1%</td>
<td>4.1%</td>
</tr>
<tr>
<td>Sedatives</td>
<td>4.3%</td>
<td>4.3%</td>
</tr>
<tr>
<td>Hallucinogens</td>
<td>4.0%</td>
<td>4.0%</td>
</tr>
<tr>
<td>MDMA (Ecstasy)</td>
<td>3.6%</td>
<td>3.6%</td>
</tr>
<tr>
<td>OxyContin</td>
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<td>3.3%</td>
</tr>
<tr>
<td>Cocaine (any form)</td>
<td>2.6%</td>
<td>2.6%</td>
</tr>
<tr>
<td>Inhalants</td>
<td>1.9%</td>
<td>1.9%</td>
</tr>
<tr>
<td>Salvia</td>
<td>1.8%</td>
<td>1.8%</td>
</tr>
<tr>
<td>Ritalin</td>
<td>1.8%</td>
<td>1.8%</td>
</tr>
</tbody>
</table>

* Only 12th graders surveyed about sedatives use

Source: University of Michigan, 2014 Monitoring the Future Study
**Who will develop aberrant behaviour?**

**Addiction: interaction GxExS**

**US:** 16% of non-medical users become dependent

**Norway**, weak opioid: 0.3% and 0.08–0.5% of new users develop prescription patterns indicating persistent opioid use and problematic opioid use.

**Vulnerability**

- Higher risk if starts at an **early age**
- 42% (< 13 years) vs 17% (> 21 years)

Genetics, comorbidities:
- other addictions, psychiatric, pain, and sleep disorders

**E**

Role of the **environment**

---

TEENS ARE MORE LIKELY TO USE E-CIGARETTES THAN CIGARETTES

*Past-month use

- 8th grade: 3.6%
- 10th grade: 6.3%
- 12th grade: 11.4%

64.7% of 12th graders reported vaporizing “just flavoring” in their last e-cigarette; some didn’t know what they inhaled. E-cigs are unregulated so flavored liquid might actually contain nicotine.

---

CIGARETTES

E-CIGARETTES

WWW.DRUGABUSE.GOV
LAST TWO DECADES OF ALCOHOL, CIGARETTE, AND ILlicit DRUG USE*

*Past-month use

Alcohol
- 1995: 60%
- 2015: 50%
- 2015: 40%
- 2015: 30%
- 2015: 20%
- 2015: 10%

Cigarettes
- 1995: 50%
- 2015: 40%
- 2015: 30%
- 2015: 20%
- 2015: 10%

Illicit drugs
- 1995: 40%
- 2015: 30%
- 2015: 20%
- 2015: 10%

2015
- 35.3% of 12th graders
- 21.5% of 10th graders
- 9.7% of 8th graders

- 11.4% of 12th graders
- 6.3% of 10th graders
- 3.6% of 8th graders

- 23.6% of 12th graders
- 16.5% of 10th graders
- 8.1% of 8th graders

WWW.DRUGABUSE.GOV

National Institute on Drug Abuse

DEPARTMENT OF HEALTH AND HUMAN SERVICES
PREScription/OVer-the-Couter vs. Illicit Drugs*

<table>
<thead>
<tr>
<th>Drug Type</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amphetamines</td>
<td>7.7%</td>
</tr>
<tr>
<td>Adderall</td>
<td>7.5%</td>
</tr>
<tr>
<td>Opioids other than Heroin</td>
<td>5.4%</td>
</tr>
<tr>
<td>Tranquilizers</td>
<td>4.7%</td>
</tr>
<tr>
<td>Cough Medicine</td>
<td>4.6%</td>
</tr>
<tr>
<td>Vicodin</td>
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<td>Inhalants</td>
<td>1.9%</td>
</tr>
<tr>
<td>Salvia</td>
<td>1.9%</td>
</tr>
</tbody>
</table>

*The percentage of 12th graders who have used these drugs in the past year.

Despite the ongoing opioid overdose epidemic, past-year use of opioids other than heroin has decreased significantly each year over the past 5 years among the nation’s teens.

Heroin use has also decreased over the past 5 years and is at the lowest rate since the MTF survey began.

PREScription/OTC  ILLICIT DRUGS

NIH National Institute on Drug Abuse

WWW.DrugAbuse.Gov
Opioid pain reliever-related overdose deaths increasing at a faster rate than deaths from any major cause

% change in number of deaths, United States, 2000-2010

- Rx opioid overdose: 276%
- Alzheimer's: 68%
- Hypertension: 47%
- Parkinson's Disease: 40%
- Nephritis: 36%
- Suicide: 31%
- Liver Disease: 20%
- Chronic Lower Respiratory disease: 13%
- Septicemia: 11%
- HIV: 7%
- Malignant Neoplasms: 4%
- Pneumonitis: 2%
- Diabetes Mellitus: 0%
- Homicide: -3%
- Perinatal Period: -14%
- Heart disease: -16%
- Motor vehicle traffic: -22%
- Cerebro-vascular: -23%
- Influenza & Pneumonia: -23%
- Aortic Aneurysm: -34%

WISQARS, 2000 and 2010; CDC/NCHS, National Vital Statistics System
Predicted Age-Adjusted Death Rates due to Drug Poisoning:

1999-2000
2004-2005
2008-2009

Source: Rossen et al, 2013, AJPM
Tourists!! Thank God! May I suggest restaurants, hotels, destinations?

We're just here to buy some pain pills.
Florida Shutting ‘Pill Mill’ Clinics

WEST PALM BEACH, Fla. — Florida has long been the nation’s center of the illegal sale of prescription drugs: Doctors here bought 89 percent of all the OxyContin sold in the country last year. At its peak, so many out-of-staters flocked to Florida to buy drugs at more than 1,000 pain clinics that the state earned the nickname “Oxy Express.”

But with the help of tougher laws, officials have moved aggressively this year to shut down so-called pill mills and disrupt the pipeline that moves the drugs north. In the past year, more than 400 clinics were either shut down or closed their doors.

Prosecutors have indicted dozens of pill mill operators, and nearly 80 doctors have seen their licenses suspended for prescribing mass quantities of pills without clear medical need.
Chart 5. Retail-level Average Purity of Heroin in the United States, 1981 to 2012

Chart 6. Retail-level Average Price Per Gram Pure, for Heroin in the United States, 1981 to 2012

Source: Institute for Defense Analyses and ONDCP
Map 2. Percentage of 2015 NDTs Respondents Reporting Heroin as Greatest Drug Threat, by OCDETF Region

- Pacific: 33.4%
- Southwest: 4.3%
- West Central: 15.5%
- Great Lakes: 67.4%
- Midwest: 74.7%
- New England: 63.4%
- New York/New Jersey: 48.4%
- Florida/Caribbean: 7.8%

Source: 2015 National Drug Threat Survey
Opioid pain reliever prescribing rates vary by state

Some states have more painkiller prescriptions per person than others.

6. A large part of the problem has been the rise of painkillers and heroin, especially in the Northeast.

(Map shows the drug most commonly cited in drug treatment admissions in each state)
**Figure 2** High school ACL injury rates

High school anterior cruciate ligament (ACL) injury rates per 100,000 athlete exposures (AEs) by sport and sex. (An athlete exposure is 1 athlete participating in 1 practice or competition.)

<table>
<thead>
<tr>
<th>Sport</th>
<th>Girls</th>
<th>Boys</th>
<th>Girls</th>
<th>Boys</th>
<th>Girls</th>
<th>Boys</th>
</tr>
</thead>
<tbody>
<tr>
<td>soccer</td>
<td>11.7</td>
<td>4.7</td>
<td>11.2</td>
<td>2.4</td>
<td>3.1</td>
<td>0.5</td>
</tr>
</tbody>
</table>

Adapted from Comstock RD, et al.³
Signs and Symptoms at School

Small or “pinpoint” pupils

An overall unhealthy look

Weight loss

Vomiting

Constipation

“Nodding off” to sleep

Laxative use

In females, not getting a period

Depression

Track marks on arms (scars or bruises from using needles)

Itches and scratches on the skin

Loss of friendships

Problems in school or at work

Lose interest in activities
Signs at Home

More time spent away from home

Frequent, secret phone calls

Trouble with the police

Missing money, credit cards, and/or valuables

Pawn slips

Purchases returned for refunds

Small plastic Ziploc bags

Bottles of vinegar and bleach and cotton balls
Welcome to PrescribeToPrevent.org

Here you will find information you need to start prescribing and dispensing naloxone (Narcan) rescue kits, including some useful resources containing further information about this life-saving medicine. We are prescribers, pharmacists, public health workers, lawyers, and researchers working on overdose prevention and naloxone access. We compiled these resources to help health care providers educate their patients to reduce overdose risk and provide naloxone rescue kits to patients.

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Opioid Safety and How to Use Naloxone

Overdose prevention and response instructions

Overdose prevention and response instructions - American Society of Anesthesiologists

NYC Dept. of Health, "Take Care, Take Charge", Safety Tips for People Who Use or Inject Drugs

SAMHSA

SAMHSA Opioid Overdose Toolkit
- Facts for Community Members
- Five Essential Steps for First Responders
- Information for Prescribers
- Safety Advice for Patients & Family Members
- Recovering from Opioid Overdose - updated 2014

Federal Guidelines for Opioid Treatment Programs
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Foreword by Peter A. Levine, PhD, author of Waking the Tiger: Healing Trauma

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