Impacts of Substance Use and Mental Health on Young Adult Health and Development

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Combined Annual Meeting

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PART 1: The Challenges
PART 2: Mechanisms – the Whys
PART 3:
Moving Upstream: Strategies and Solutions
PART 1:
The Challenges
College Students

- They comprise a very large segment of the population (~14.5 million individuals)

- Large societal and familial investment

- Given our investment, they aren’t doing as well as we might have hoped.
Measures of Academic Success among Universities in the United States

- Freshman retention rate:
  - Large Public: 86.6%
  - Small Public: 83.1%
  - Private: 66.7%

- Six-year graduation rate:
  - Large Public: 73.8%
  - Small Public: 61.0%
  - Private: 37.6%

- Five-year graduation rate:
  - Large Public: 71.1%
  - Small Public: 54.8%
  - Private: 32.5%

- Four-year graduation rate:
  - Large Public: 60.5%
  - Small Public: 33.5%
  - Private: 18.5%
Impact on Global Competitiveness

“America’s schools face unprecedented challenges to prepare students for postsecondary education and entry into the U.S. and global workforce. The skills of the current and future workforce are closely tied to our nation’s ability to thrive in a global economy.”

Source: The Role of Common Core Standards in College and Career-Readiness Education, July 2013
“When it comes to the types of skills and knowledge that employers feel are most important to workplace success, large majorities of employers do NOT feel that recent college graduates are well prepared. This is particularly the case for applying knowledge and skills in real-world settings, critical thinking skills, and written and oral communication skills — areas in which fewer than three in 10 employers think that recent college graduates are well prepared. Yet even in the areas of ethical decision-making and working with others in teams, many employers do not give graduates high marks.”

Source: Falling Short? College Learning and Career Success, January 2015
National data: Past-month alcohol and other drug use among 18 to 22-year-olds, by college enrollment

- **“Binge use”** defined as “Five or more drinks on the same occasion at least once in the past 30 days.”
- **“Heavy use”** defined as “Five or more drinks on the same occasion on each of 5 or more days in the past 30 days.”

<table>
<thead>
<tr>
<th>Substance</th>
<th>Non-college</th>
<th>College</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ecstasy</td>
<td>1.2</td>
<td>1.4</td>
</tr>
<tr>
<td>Nonmedical Rx</td>
<td>5.9</td>
<td>4.7</td>
</tr>
<tr>
<td>Hallucinogens</td>
<td>2.1</td>
<td>2.2</td>
</tr>
<tr>
<td>Cocaine</td>
<td>1.4</td>
<td>0.9</td>
</tr>
<tr>
<td>Marijuana use</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Any illicit drug</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heavy alcohol**</td>
<td>9.3</td>
<td>12.7</td>
</tr>
<tr>
<td>Binge alcohol*</td>
<td>33.4</td>
<td>39.0</td>
</tr>
<tr>
<td>Alcohol use</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

As of [year], the data shows a comparison between non-college and college students in terms of various drug use behaviors. The graph illustrates the percentage of students engaging in different substances, with notable points including:

- **Alcohol use**: College students show a higher percentage compared to non-college students.
- **Binge alcohol**: College students have a slightly higher percentage than non-college students.
- **Heavy alcohol**: A notable difference is observed, with college students engaging in heavy alcohol use more frequently.

Trends in *Annual* Prevalence of an Illicit Drug Use Index across 5 Populations

College Life Study

- **Post College Year 4**
  - 24 Months: Interview (n=1,101) 88%

- **Post College Year 3**
  - 72 Months: Interview (n=982) 78%

- **Post College Year 2**
  - 60 Months: Interview (n=1,001) 80%

- **Post College Year 1**
  - 48 Months: Interview (n=1,019) 81%

- **Senior Year**
  - 36 Months: Interview (n=1,097) 88%

- **Junior Year**
  - 24 Months: Interview (n=1,101) 88%

- **Sophomore Year**
  - 12 Months: Interview (n=1,142) 91%

- **First Year**
  - Baseline Interview (n=1,253)

- **Summer Orientation**
  - Screening (n=3,401)
Domains Measured in the CLS

Demographics
Family Composition
Gender
Race/Ethnicity
Socioeconomic Status
Parental Education

Mental Health
Depression
Bipolar
Anxiety
ADHD
Suicide Ideation

Individual Characteristics
Personality
Religiosity
Sensation-seeking
Dysregulation
Perceived Harm
Physical Health

Stress
General Distress
Life Event Stress
Social Support

Peer Relations

Parent Influences
Parental Monitoring
Relationship Quality
Communication
Parental Authority Style
Family History

High School & College Experiences
Volunteer work
Extracurricular Activities
Academic Achievement
Scholarships
Goals and Expectations
Illicit and nonmedical drug use in the first four years of college

Weighted percent of students who used drug at least once in lifetime

Data weighted to adjust for both sampling bias and attrition.

Source: College Life Study. Not for redistribution without written consent from Dr. Amelia M. Arria, PI
Estimated probabilities of developing alcohol dependence based on drinking level at college entry (College Life Study)

Drinking level at **college entry**:

- **High-risk Drinkers:** 26% (6+ drinks/day)
- **Medium Risk Drinkers:** 40% (3-5 drinks/day)
- **Low-risk Drinkers:** 22% (1-2 drinks/day)
- **Non-drinkers:** 12%

Source: College Life Study. Not for redistribution without written consent from Dr. Amelia M. Arria, PI
Figure 1. Trends in past-year nonmedical use of prescription medications: 2003-2013

Please cite this article as: McCabe SE, West BT, Teter CJ, Boyd CJ. Trends in Medical Use, Diversion, and Nonmedical Use of Prescription Medications among College Students from 2003 to 2013: Connecting the Dots, Addictive Behaviors (2014), doi: 10.1016/j.addbeh.2014.03.008
Mental health of college students

- 46% of college students meet criteria for at least one DSM-IV disorder in the past year, 75% of whom do not receive treatment (Blanco et al., 2008)

- Severity and complexity of health center caseloads is increasing (Benton et al., 2003; Gallagher, 2010)

- Depression prevalence is increasing (ACHA, 2006)

- 10% seriously consider suicide (ACHA, 2006)

- Recent high-profile tragedies – students who “fell through the cracks”
How many college students screen positive for current mental health problems?

- **Any depressive or anxiety disorder**: 15.6% (Undergraduate students), 14.0% (Graduate students)
- **Depression (major or other)**: 13.8% (Undergraduate students), 11.3% (Graduate students)
- **Anxiety (panic or GAD)**: 4.2% (Undergraduate students), 3.8% (Graduate students)
- **Suicide ideation***: 2.5% (Undergraduate students), 1.6% (Graduate students)

*During the past 4 weeks

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Marijuana use and health outcomes

- Constructed six subgroups based on marijuana use during college
- Examined 10 possible health outcomes seven years after college entry
- Groups differed on functional impairment, general health rating, psychiatric symptoms, quality of life, and service utilization for physical and mental health problems
- Adjusted for tobacco and alcohol use trajectory, baseline health status and other variables
Summary of Challenges

- Academic issues
- Excessive drinking
- A complex drug landscape
- Mental health problems
- Connections between AOD, mental and physical health
- Lack of self-recognition of problems by students
- Many well-intentioned parents have views that are at odds with the research evidence
Substance Use and Academic Achievement
Academic Performance Problems

Substance Use

Substance Use

Academic Performance Problems
America’s Dropout Crisis:

The Unrecognized Connection
To Adolescent Substance Use

“There is no problem so bad that alcohol and drugs will not make it worse.”

March, 2013

Available online at www.cyahd.umd.edu
Cumulative Frequency of Cannabis Use and Educational Outcomes

(Fergusson et al., 2003)

- Never Used
- 1-9 times
- 10-99 times
- 100+ times

- Leaving School without Qualifications
- Enrolling in University by age 21
- Attaining University degree by age 25
Excessive Drinking and Academic Performance

- Alcohol, sleepiness, and GPA
  (Singleton and Wolfson, 2009)

- Excessive drinking and fewer interactions with faculty
  (Porter and Prior, 2007)

- Alcohol use and decreases in GPA
  (Pascarella, 2007)
Time spent studying, by high-intensity drinking

Weighted mean number of hours/week spent studying

High-intensity drinkers

Source: College Life Study. Not for redistribution without written consent from Dr. Amelia M. Arria, PI
Time spent studying, by frequency of illicit drug use

Year of College

Weighted mean number of hours/week spent studying

Source: College Life Study. Not for redistribution without written consent from Dr. Amelia M. Arria, PI
“Stopping out” – Gaps in College Enrollment
Patterns of marijuana use during college College Life Study

Number of days used in the past month

Year 1 Year 2 Year 3 Year 4

Chronic/Heavy: 6.7%
Decreasing: 5.2%
Infrequent: 20.3%
Minimal: 60.2%
Increasing: 7.6%

Marijuana use trajectories: relationship to “discontinuous” enrollment

Chronic/Heavy marijuana users were 2.0 times as likely as “minimal users” to have discontinuous enrollment......even after controlling for demographics, personality, and high school GPA.

<table>
<thead>
<tr>
<th>Marijuana Trajectory Group Membership</th>
<th>n</th>
<th>% of Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimal</td>
<td>682</td>
<td>60.2</td>
</tr>
<tr>
<td>Infrequent</td>
<td>230</td>
<td>20.3</td>
</tr>
<tr>
<td>Decreasing</td>
<td>59</td>
<td>5.2</td>
</tr>
<tr>
<td>Increasing</td>
<td>86</td>
<td>7.6</td>
</tr>
<tr>
<td>Chronic/Heavy</td>
<td>76</td>
<td>6.7</td>
</tr>
</tbody>
</table>

Patterns of illicit drug use during college

*College Life Study*

Number of illicit drugs used in the past year

- High: 12.3%
- Low: 29.3%
- Minimal: 58.4%

Drugs other than marijuana: relationship to “discontinuous” enrollment

“High-level” drug users were 2.0 times as likely as “minimal users” to have discontinuous enrollment... even after controlling for demographics, personality, and high school GPA.

<table>
<thead>
<tr>
<th>I illicit Drug Trajectory Group Membership</th>
<th>n</th>
<th>% of Sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimal</td>
<td>662</td>
<td>58.4</td>
</tr>
<tr>
<td>Low</td>
<td>332</td>
<td>29.3</td>
</tr>
<tr>
<td>High</td>
<td>139</td>
<td>12.3</td>
</tr>
</tbody>
</table>

Marijuana and alcohol use: relationships to discontinuous enrollment

First year alcohol use (typical number of drinks/day) and frequency of marijuana use was related to late discontinuity, even after controlling for demographics, psychiatric symptoms and diagnosis, and high school GPA.

Brook, JS; Lee, JY; Finch SJ; Seltzer N; Brook DW (2013) Adult Work Commitment, Financial Stability, and Social Environment as Related to Trajectories of Marijuana Use Beginning in Adolescence. *Substance Abuse*; 34(3): 298-305.
Marijuana Use Trajectory Group and Financial Stability
(Brook et al., 2013)

Financial Problems

Financial Independence

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Brook, JS; Lee, JY; Finch SJ; Seltzer N; Brook DW (2013) Adult Work Commitment, Financial Stability, and Social Environment as Related to Trajectories of Marijuana Use Beginning in Adolescence. *Substance Abuse*; 34(3): 298-305. Financial problems was measured with a six-item scale (highest 16th percentile); Financial independence with a three-item scale (yes to all three items = 1).
Marijuana Trajectory Class and Earnings at Age 29

(Ellickson et al., 2004)

Abstainers
Steady Increasers
Stable Light Users
Early High Users

Source: College Life Study. Not for redistribution without written consent from Dr. Amelia M. Arria, PI
Marijuana Use Freq. (intercept) $R^2 = .49$

Skipping Class (intercept) $R^2 = .37$

Semester GPA (intercept) $R^2 = .24$

Time to Graduation $R^2 = .32$

Estimates for overall sample:

<table>
<thead>
<tr>
<th>Variable</th>
<th>Intercept Mean (SE)</th>
<th>Slope Mean (SE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marijuana</td>
<td>.23 (.81)</td>
<td>-.26 (.35)</td>
</tr>
<tr>
<td>Skipping</td>
<td>5.2 (2.0)</td>
<td>-1.4 (0.8)</td>
</tr>
<tr>
<td>GPA</td>
<td>27.6 (1.1)</td>
<td>1.5 (0.3)</td>
</tr>
</tbody>
</table>

Source: College Life Study. Not for redistribution without written consent from Dr. Amelia M. Arria, PI
THE ACADEMIC OPPORTUNITY COSTS OF SUBSTANCE USE DURING COLLEGE

A Brief Report from the Center on Young Adult Health and Development

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Kathleen A. Vincent, M.A.
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May 2013

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opportunity cost:
what a person sacrifices when they choose one option over another
active minds
changing the conversation about mental health
National Day Without Stigma
Nearly half of students say that their mental health affected their academic performance in the past month.

One in five missed academic obligations during the past week due to mental health problems.

• The presence of a psychiatric disorder makes a student significant less likely to complete a college degree, especially when the disorder is diagnosed during college.

• Students with anxiety and mood disorders are less likely to graduate than other students.

• Having more than one psychiatric disorder increases the risk of not graduating.

Discontinuous College Enrollment: Associations with Substance Use and Mental Health

Introduction: This study examined the prospective relationship of substance use and mental health problems with early discontinuous college enrollment. Participants were 1,461 students at a large public college. Participants were identified as discontinuously enrolled if they were non-enrolled annually for at least one year of the four years beginning at college entry in 2004. Discontinuous enrollment was defined as a gap in enrollment of one or more semesters during the first two years. Discontinuously enrolled students were compared with students who enrolled continuously for all four years. Exploratory variables included students’ academic performance, social support, and the number of times a student was non-enrolled during the four semesters. Income level, parents’ education, and racial/ethnic background was also assessed.

Methods: Multivariate logistic regression models were developed to evaluate the relationship between substance use and discontinuous enrollment. Substance use was assessed using the Timeline Followback Survey, a validated measure of lifetime substance use.

Results: Higher AP scores predicted early discontinuity but did not predict discontinuity, whereas cannabis and alcohol use predicted discontinuity, especially during college. Dis discontinuously enrolled students were more likely to report substance use and mental health problems, including depression and anxiety, compared to continuously enrolled students. Furthermore, discontinuously enrolled students were more likely to report depression and anxiety, compared to continuously enrolled students.

Discussion: These findings highlight the importance of addressing substance use and mental health problems in college students. Early intervention programs that target substance use and mental health problems in college can help reduce discontinuous enrollment and improve student outcomes.
By the fourth year of the study, 14% of our sample received a diagnosis of depression.
Individuals who were diagnosed with depression during college were three times more likely to experience early discontinuity, even after controlling for demographics, drug and alcohol use, and high school GPA.

Depression and Academic Performance

Depression

Poor Academic Performance
What do you think are the top three reasons cited for poor academic performance among students surveyed in a national study?
Top self-identified reasons for poor academic performance (ACHA, 2012)

- Stress: 27.5%
- Sleep: 19.4%
- Anxiety: 19.1%
- Cold, Flu, Sore Throat: 16.4%
- Work: 13.3%
- Internet Use/Games: 12.4%
- Depression: 11.9%
- Concern for friends, family: 11.0%
- Relationship Issues: 10.5%
Top **self-identified** reasons for poor academic performance (ACHA, 2012)

<table>
<thead>
<tr>
<th>Reason</th>
<th>Percentage</th>
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</thead>
<tbody>
<tr>
<td>Stress</td>
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</tr>
<tr>
<td>Relationship Issues</td>
<td>10.5%</td>
</tr>
</tbody>
</table>

*Where’s alcohol, drug use?*
PART 2:
Mechanisms – the Whys
Why do most 16-year-olds drive like they’re missing a part of their brain? Because they are.
Why does drug use have a negative impact on academic performance?

1. “Toxic” Effect on Cognition:

Substance use is associated with attention problems, sleep disturbances, and other cognitive deficits, making classroom learning, studying and homework more difficult.
In adolescents, heavy alcohol use is associated with:

- Structural and function changes in the brain
- Differences in sleep patterns
- Poor planning
- Impaired executive functioning
- Spatial deficits
- Attention deficits
Acutely, marijuana use is associated with:

- Attention and concentration difficulties
- Decreased working memory
- Decreased information processing
- Decreased decision response speed

Longer-term...

- Impaired planning, organizing, and problem solving
- Deficits to allocation of attentional resources and filtering out irrelevant material
- Retrieval and immediate verbal memory deficits
Poor sleep

- Poorer negative moods
- Higher levels of stress
- More physical illness
- Use of prescription, OTC, and other drugs
- Drinking more alcohol

Why does drug use have a negative impact on academic performance?

2. “Hijacking” of Brain Reward Pathways

Substance use “hijacks” reward pathways in the brain.

Academic pursuits become less meaningful as drugs become more valued.
Risk and Reward...

1. Is it risky?

2. Is there a benefit to using?

3. Does the benefit outweigh the risk?
What influences the balance of perceptions between risk and reward?
"We found that youths with consistent ‘E’ values, in all five assessments, were an estimated nine times more likely to try cocaine by young adulthood as compared to youths who consistently placed themselves at the lower end (‘A’ position) of the wall values."
What peers think, say and do compounds risk-taking – Experiments show that adolescents can behave “adult-like” in the absence of peers.
Deviant peer affiliation compounds substance use problems – having peers that also do not care about academic pursuits makes learning problems worse and encourages more substance use.
Parents matter too... parents who disapprove of early drinking and set zero tolerance limits on alcohol use during adolescence reduce their child’s chances of alcohol problems later in life.

Parents set expectations and monitor academic performance.
PART 3:
Moving Upstream: Strategies and Solutions
PART 3: STRATEGIES AND SOLUTIONS

a. Individual Approaches
b. Connecting with Parents
c. Bolstering Capacity of Educational Professionals
A 2010 study of 351 colleges and universities found that:

- 58% of college administrators had reviewed the recommendations, but 1 in 5 were not aware that recommendations had been made.

- 98% of colleges and universities offered alcohol education programs, but less than half required students to complete it.

- Only half of schools offered intervention programs that were empirically supported.

Create a system for screening, identifying and intervening with college students with different levels of alcohol involvement.
PART 3: STRATEGIES AND SOLUTIONS

a. Individual Approaches
b. Connecting with Parents
c. Bolstering Capacity of Educational Professionals
Research shows that parents can have a powerful impact on behavioral choices early on, but in college the nature of their influence changes.
Q. During your senior year of high school, how many drinks would your parents/guardians consider to be the upper limit for you to consume on any given occasion?

Source: MD-CAS. Not for redistribution without written consent from Dr. Amelia M. Arria, PI
Messages from parents impact risk for weekend drinking during college

Getting them to college is just the beginning... With **good communication** you will guide them through it.

Your child still needs your guidance to navigate the obstacles standing between them and their diploma. Excessive drinking can be one of the biggest. It is a serious problem that undermines students' health, safety, and academic success, for both themselves and their fellow students. Parents like you can help students avoid such problems... And keeping those lines of communication open is where you start.

6 **HIGH RISK DRINKING SITUATIONS TO TALK ABOUT**

7 **TIPS FOR GOOD COMMUNICATION**
High Risk Drinking Situations To Talk About

Click on the image

Spring Break

Off-Campus Housing

What situations would you like to see?
What topics are you concerned about?
Click here to let us know and subscribe to get updates!

21st Birthday

Holidays

Housing & Roommates

Impaired Driving

The Maryland Collaborative
To Reduce College Drinking and Related Problems. All Rights Reserved.
PART 3: STRATEGIES AND SOLUTIONS

a. Individual Approaches
b. Connecting with Parents
c. Bolstering Capacity of Educational Professionals
Academic Affairs

Student

Student Affairs
Expand Role of Academic Assistance Center professionals

Screen
Identify
Intervene
Monitor
EXPAND ROLE OF ACADEMIC ASSISTANCE CENTERS

- Implement AOD/mental health screening in academic assistance centers.
- Focus on students who are struggling academically.
- Monitor both AOD use and academic performance to chart progress to student
- Include questions about concentration problems, missed classes due to AOD use, and personal academic goals.
“Connect the dots” between substance use and academic behaviors (e.g., skipping class, GPA)
Facilitate self-reflection of changing aspirations and diffusion of goals

• Develop confidential methods for “electronic student records” which facilitate self-reflection of student progress and changing goals and aspirations.

• This might help track student progress toward goals and draw connections between individual behaviors and achievements (or becoming de-railed).
Students

- Spread the word to other students about the true risks of nonmedical use.
- Challenge misperceptions about “how many people are doing it.”
- Link nonmedical drug use to illicit drug use.
- Dispel “smart drug” myth.
Parents

- Dispel “smart drug” myths
- Do not condone or facilitate drug use
- Raise awareness about the opportunities for “new” drug use in college
- Educate parents to recognize signs of emerging mental health and drug problems
- Educate parents regarding medication adherence and role modeling of proper medication use
- Parent effectively to reduce risk of use
Colleges and Universities

- Sponsor ongoing dialogues that raise awareness and share experiences of college professionals
- Develop multidisciplinary campus action plans to reduce nonmedical prescription stimulant use.
- Have students re-think taking 18 credits per semester in the first year of college.
- Consider options for enforcing sanctions against diversion.
Give students who _don’t_ use a LOUDER voice
Trends in Abstaining from Illicit Drugs, Alcohol and Cigarettes - Lifetime

- 2013, 61.9%
- 2013, 38.9%
- 2013, 25.1%

1976, 5.1%
1991, 9.0%
1991, 24.0%

Monitoring the Future, not published.
Interlocking Dimensions of Student Success

- Cognitively Strong
- Motivated
- Supported
Acknowledgments

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Department of Behavioral and Community Health
Center on Young Adult Health and Development
Special Focus on Nonmedical Use of Prescription Stimulants
Motives
Access and Availability

Among college students, friends and peers are the most common sources to obtain prescription medications used nonmedically.

References:
McCabe SE, Boyd CJ. Sources of prescription drugs for illicit use. Addict Behav 2005;30(7):1342-1350.
How often do users take prescription stimulants nonmedically?

Source: College Life Study. Not to be shown or redistributed without written permission from Amelia M. Arria, PI
DIVERSION

60.2% of one sample of college students with ADHD shared or sold their prescription stimulants;

35.4% of students with prescription analgesics diverted their medications.

Students overestimate how many others use stimulants nonmedically.

Nonmedical Use is also associated with:

- High levels of positive expectancies about the purported benefit on performance
- Low levels of negative expectancies about consequences

"It will work"

"I won’t get in trouble"

Nonmedical prescription drug use is strongly associated with alcohol and other drug use

- Numerous studies report past-year prevalence estimates for marijuana use of 85%+
- Cocaine: 35-60%
- Ecstasy: 52%
- Prescription Analgesics: 44%
Nonmedical stimulant users spend less time studying, skip classes more often, and earn lower grades.

Marijuana Dependence

Nonmedical Use of Prescription Stimulants for Studying

Marijuana Use

Skipping Class

Academic Performance

Time
Nonmedical Use

Medically Supervised Use

Medical Overuse

RISK FOR ILLICIT DRUG USE
Improving Clinical Practice on College Campuses

- Increase vigilance regarding diversion and nonmedical use among college-bound patients.
- Partner with local university health centers to promote staff awareness of diversion and the risks of nonmedical use.
- Work with counseling center staff to recognize signs of mental health issues and drug problems... and intervene with students who are academically struggling.
- Screen ADHD patients for illicit drug use and convey risks of diversion.