

Psychopharmacology in Adolescents

Saturday, July 17, 2010
10:30am – 12:00pm
Arizona Biltmore

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Disclosure

- Dr. Schulte speaks for the following pharmacy companies: Pfizer, Schering-Plough, AstraZeneca, Bristol Meyers Squibb, Wyeth, Forest, Sanofi Aventis,
- This lecture is sponsored by Arizona Pharmacy Alliance (AzPA)

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Outline



- Adolescent Substance Abuse
 - Case Example
 - Diagnosis
 - Demographics
 - Risk Factors
 - Progression
 - Treatment
- Non Medical use of Prescription Medication
- “Sharing and Selling of Prescription Medications in a College Student Sample” Garnier et. al J Clin Psychiatry. 2010 Mar;71(3):262-9
- Neuro-Enhancement
- Summary

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Learning Objectives



- Understand the magnitude and effect of adolescent substance abuse
- Enhanced cognizance of non-medical prescription drug use
- Increased awareness of the frequency of sharing/selling prescription medications

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Adolescent Substance Abuse



- Case Example – HH, 21yr old female
- Diagnosis
 - Substance Dependence
 - Substance use leading to clinically significant impairment. At least 3 criteria at anytime in a 12 month period

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Substance Dependence



1. Tolerance, as defined by either of the following
 - Markedly increased amounts of substance to achieve intoxication
 - Markedly diminished effect with continued use of the same amount of the substance

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2. Withdrawal is manifested by either of the following:
 - Characteristic withdrawal syndrome for the substance
 - The same (or closely related) substance is taken to relieve or avoid withdrawal symptoms

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3. Substance is often taken in larger amounts or over longer period than intended
4. A persistent desire or unsuccessful efforts to cut down or control substance use
5. A great deal of time is spent in activities necessary to obtain the substance (visiting multiple doctors or driving long distances), use of the substance (methamphetamine binges) or recover from its effects

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6. Important social, occupational or recreational activities are given up or reduced because of the substance use
7. Substance use is continued despite persistent or recurrent physical or psychological problems that have been caused or exacerbated by the substance (e.g. continued cocaine use despite recognition of cocaine induced depression or continued drinking despite an ulcer made worse by alcohol)

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- With physiological dependence; i.e. tolerance or withdrawal
- Without physiological dependence, no evidence of tolerance or withdrawal

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Substance Abuse



- Pattern of use leading to significant impairment as manifested by one or more of the following in a 12 month period
 1. Recurrent substance use resulting in failure to fulfill major role obligations at work, school or home (e.g. repeated absences, poor performance due to substance use)

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Substance Abuse



2. Recurrent use in situations which is physically hazardous (i.e. driving a vehicle while impaired) (for every DUI 200 times drove impaired before caught)
3. Recurrent substance related legal problems (e.g. DUI, disorderly conduct, minor in possession)
4. Continued use despite persistent or recurrent social or interpersonal problems caused or exacerbated by the effects of the substance (i.e. arguments with Parents, physical fights)
5. Symptoms have never met criteria for substance dependence

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Substance Abuse



- Adolescents with substance abuse frequently may not fulfill the complete criteria as these are designed for adults, there is no specific diagnostic criteria for adolescents.
- If an adolescent is using a substance and having recurrent problems at home, school, peers or health; refuses to stop using in spite of intervention, then they have substance abuse. This may be combined with mood disorder, anxiety disorder, ADHD and family dysfunction.

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Demographics



- Over 6.2M people aged 12 and over abused prescription drugs in the last month.
- Everyday, 4047 children and young adults begin experimenting with prescription drugs.
- Only 4% of children who abuse prescription drugs get them from a stranger, a drug dealer or the internet.

Substance Abuse and Mental Health Services Administration 2008 National Survey on Drug Use and Health: National Findings. 14



- 9% of adolescents 12-17 years used prescription drugs for non medical purposes in the last year
- 2% admitted non medical use of stimulant medication

National Survey on Drug use and Health 2009

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- One in 5 teens share their prescription drugs with friends
- Survey of 12-17 year olds in US found 20% gave drugs such as Oxycotin or Darvocet to friends or obtained the same way.
- Most common drugs: allergy drugs, narcotic pain relievers, antibiotics, acne medications, anti-depressants and anti-anxiety meds
- 75% who borrowed drugs did so in lieu of visiting a doctor
- 1/3 who borrowed drugs had allergic reaction or other negative side effect
- 40% of adults share their meds

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Goldsworthy PhD, Mayhorn, PhD. "Prescription Medication Sharing Among Adolescents: Prevalence, Risks, and Outcomes Journal of Adolescent Health Online, August 2009



- National Institute on Drug Abuse
 - Prescription drugs rank second behind Marijuana abuse
 - Kids share asthma drugs – inhaler
 - Share Accutane”Like your friend could be oh, you know it helped me, it could help you” says Jennifer, 18, Even one dose can do fetal damage.
 - 17year old Ginny says “I think there’s a lot of sharing of medication, prescription medications. It’s kind of come to not be such a big deal”.

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- Survey of 1500 boys and girls ages 9 to 18 years old showed 19.7% girls and 13.4% of boys borrow or share prescriptions with both friends and family (Centers for Disease Control 2010)
- 7% of 15-18 year old girls shared prescription meds more than 3 times
- 11% of 12-18 year old girls wanted “something for pimples or oily skin”
- 2/3 said received meds from a family member (Pediatrics 2010)

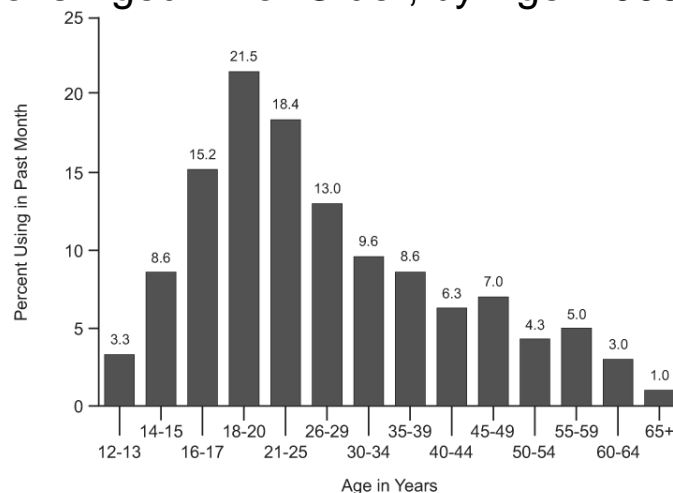
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- Partnership for Drug Free America
 - 20% 9 – 12 grade teens abuse prescription meds or over the counter cough medicine (Dextromethorphan) 3.2 million
 - 1 in 7 teens (15%), 2.4 million, abused prescription pain relievers in the past year
 - Perceived availability – risk factor
 - 56% thought Rx drugs easier to get than illegal drugs
 - 62% teens likely get it from family medicine cabinet.

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Past Month Illicit Drug Use among Persons Aged 12 or Older, by Age: 2008



Illicit Drug Use: Marijuana, Cocaine, Heroin, Hallucinogens, Inhalants; Non Medical Use of Pain Relievers, Tranquilizers, Stimulants and Sedatives.

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National Survey on Drug Use and Health



- Increase in ER visits due to pain meds
 - In 2008 1M ER visits from people abusing prescription pain killers and sedatives
 - About the same as heroin, cocaine and other illegal drugs
 - 5 years ago illegal drugs visits were twice as frequent as legal medications

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Delaney, Centers for Disease Control and Prevention, June 2010



- ER visits for Oxycodone and Hydrocodone more than doubled from 2004 to 2008. Many cases of overdose; some from mixing drugs or with alcohol
- CDC report last year; rate of drug related deaths doubled from 1990's to 2006. Most due to Methadone, Oxycotin, Vicodin.
- "Abuse of prescription drugs is our nations fastest growing drug problem" - Kerlikowske, Director of Office of National Drug Control Policy
- Doctors trying to correct under treatment of pain
 - Increased use
 - Patients and some doctors not recognize the risk
 - Case e.g. of Ellie.

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Positive Findings



- Cigarette smoking is at its lowest point in the history of the survey, since 1975, among 8th, 10th and 12th graders
- Methamphetamine use between 2004 and 2009 dropped from 2.3% to 1.6%
- Cocaine among 12th graders from 4.4% to 3.4%
- In 2004 – 2009 decreases in lifetime, past year and past month and binge use of alcohol among the 3 grades surveyed

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Positive Findings



- In 2009, 12th graders reported declines of hallucinogens from 5.9% - 4.7%
- Attitude towards substance abuse showed favorable changes amongst 12th graders

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Majority use stimulants appropriately



- ADHD: 12% of adolescents, 4% of Adults world wide
- Study of National Poison Control Data System 1998 to 2005 for adolescents 13-19 years - intentional abuse of meds for ADHD
 - During this time ADHD meds written for 10 to 19 year olds rose 86% (from 4.2 million to 7.8 million)
 - Calls related to teen abuse of ADHD meds rose 76% (from 330 to 581 per year) suggesting a rising problem

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Setlik, Pediatrics, August 2009

- Commentary by Dr. Benson, Child Psychiatrist in Florida
 - Over 1 million children taking ADHD meds
 - Only 581 calls to poison control centers implies majority of families appropriately monitoring their children's meds




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Areas of Concern:



- Non-medical use of Vicodin and Oxycotin increased over the last 5 years amongst 10th graders; unchanged amongst 8th and 12th graders
- 1 in 10 high school seniors reported non-medical use of Vicodin
- 1 in 20 reported abuse of Oxycotin
- What would be the effect of legalizing marijuana?

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- Percentage of students who were offered, sold, or given an illegal drug by someone on school property in Arizona (including charter schools) 2007
 - Prior 12 months
 - 37.1% total
 - 35.4% female; 38.4% male

CDC
Youth Online: Comprehensive Results

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Demographics



- Partnership for a Drug Free America
 - Data collected March – June of 2009
 - Survey of 3,287 teens grades 9 – 12
 - Teens grades 9 – 12 reported drinking alcohol in the previous month rose 11% last year
 - 39% - about 6.5 million teens, reported alcohol use.
 - Up from 35% or 5.8 million teens in 2008
 - Marijuana use 25% in the previous month up from 19%
 - High measures for marijuana and alcohol use had been on a steady decline since 1998. 50% of teens for alcohol and 27% for marijuana
 - Ecstasy use on the rise – 6% use in the previous month compared with 4% in 2008
 - Higher percent of teens than in the previous year agreed that being high feels good.
 - More teens reported having friends that usually get high at parties.
 - Teen abuse of prescription drugs and over the counter cough medicine remains stable from 2008 - 2009

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Abuse of Prescription Narcotics



- 52% of 12th graders using Oxycotin or Vicodin bought them or given from a friend
- 30% received it as a prescription
- e.g. commonly Vicodin is given for wisdom teeth extraction, only 3 or 4 days of 7 – 10 days prescription used – rest shared or sold
- “Pharm Party”
- Current year substance abuse: About 10% of population
- 14 year old girl report of obtaining drugs at local high school
- School Counselor of 8th graders (West side)
 - 20% abusing marijuana and alcohol
 - Varies by school
 - Lack of parental supervision after school

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Risk Factors



- Peer Acceptance/Peer Attitudes
 - A very strong predictor of substance abuse and relapse
 - Substance abuse in number of peers correlates strongly
 - 17 year old, 11th grade male told me that peers can purchase prescription Oxycotin and Percocet cheaply and easily at a Phoenix High School. Is this all from parents or also from illegal network?
 - High School Senior girl told me 9th and 10th graders using soma for sex. School caught the students selling it. Alcohol use before school.
- Peers and use of free time
 - Frequent hanging out with friends at the mall
 - Structured time
 - Family expectations – sports, volunteer work, reading

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Effect of Family Dynamics



- Divorce
- Parental Alcoholism
- Parental Conflict
- Job loss by a parent, any kind of stress
 - Children and adolescents absorb this stress
 - We learn our identity, our self image; given our temperament and our emotional experiences, we form about self and life
 - “It’s my fault” – guilt, shame
 - Act out
 - Over stimulation of HPA (Hypothalamus Pituitary Adrenal Axis) result in insomnia, anxiety and depression

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Development, Hormones



- School stress, grades
- Acne
- Sexual development
 - Girls having puberty by 11-12yrs old
 - Boys who develop/grow more slowly
 - Adolescent boys
- Boys give love to get sex, girls give sex to get love
 - Drugs and alcohol lower normal inhibitions

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Genetic Factors



- Positive family history, twin studies
- Family history does not separate genetic from environmental factors
 - Dr. Schukitt Study with College males who are sons of alcoholics
 - 50% chance of child of alcoholic becoming alcoholic
 - Some Studies say x4 the risk

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Risk Factor



- Psychological Factors
 - Traumatic and stressful life events – increased HPA
 - Highly Aggressive and involvement in violence
 - High novelty seeking, low harm avoidance likely
- Related to impulse control/spectrum disorder
 - ADHD

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Risk Factor



- Conduct Disorder
 - Aggression to people and animals
 - Destruction of property
 - Deceitfulness or theft
 - Serious violation of rules
- Oppositional Defiant Disorder
 - A pattern of negative, hostile and defiant behavior lasting at least 6 months, during which 4 or more of the following are present: often looses temper; often argues with adults; often actively defies or refuses to comply with adults requests or rules; often deliberately annoys others; often blames others for his or her mistakes; Often touchy or easily annoyed by others; often angry and resentful; often spiteful or vindictive; does not occur exclusively during the course of a psychotic or mood disorder.

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Risk Factors



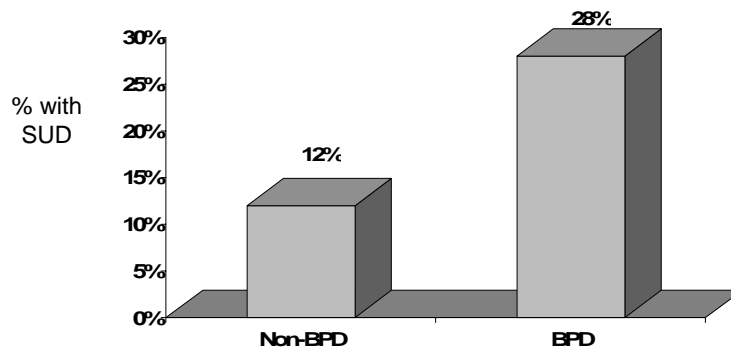
- Psychiatric Factors
 - Depression associated with substance abuse (18 – 35%), Chronic depression, suicidal thoughts/behaviors
 - Local high school last year 2 suicides; 2 deaths due to opiate overdose (Oxycotin, Heroin)
 - Adolescent substance abuse associated with 3 times the risk of adult depression and 4 times the risk of suicide attempt.
 - 19year old male with depression on Suboxone died accidentally from heroin overdose
 - Elevated rates of bipolar disorder (30%)
 - Self medication of anxiety – especially in females
 - Social Anxiety and PTSD associated with increased adolescent substance abuse

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Development of SUD in Juvenile BPD



- Youth with BPD were 2.5 times as likely to develop SUD compared to youth without BPD



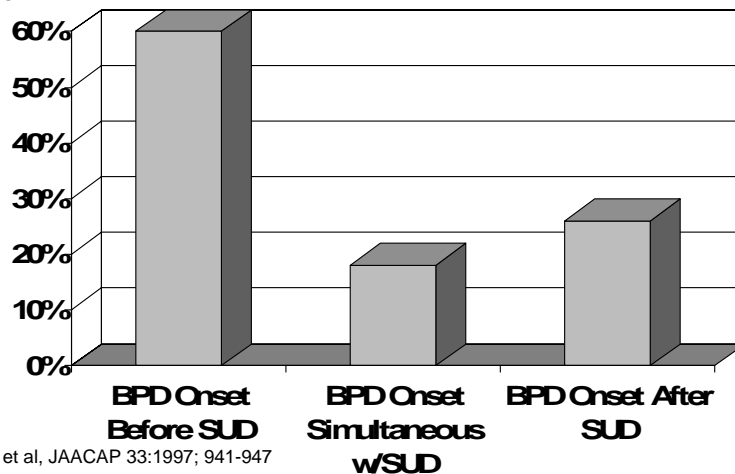
Willens et al, JAACAP 38:1999

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Development of SUD in Juvenile BPD



- Sequence of BPD to SUD



Willens et al, JAACAP 33:1997; 941-947

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Adolescent Substance Use Risk Factors



- Psychiatric Factors
 - CD has prevalence of 42-85% in adolescence with SUD
 - CD in early childhood strong predictor of later SUD in adolescence, CD not ADHD, precedes and predicts higher SUD rate.
 - Females with CD progress more rapidly than males to SUD
 - Legal involvement with SUD have higher co morbid rates than SUD without legal involvement (true in adults as well)
 - Treatment completion higher in those with affective disorders than those with CD
 - CD and ADHD significantly increase risk

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Early Risk Factor – Peer Social Influence



- Teenage boy at a party or hanging out with a coed group of peers. He looks across the room and sees a girl he's attracted to. He is sweating and petrified not knowing what to say and totally tongue tied. He's afraid to go over and talk to her. One of the guys says "here, have a hit of this", which he does and finds that all of a sudden his anxiety has diminished significantly and he can gather enough confidence to go over and talk to this pretty girl.
- One can see from this example how easy it is to start using substances to deal with the angst of being a teenager and socializing.

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Risk Factor – Peer Acceptance



- A group of 14 year old boys are hanging out. Someone passes a joint/bottle of alcohol/snort of speed, etc. What do they say to Johnny who says no?

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Progression of Substance Abuse and Addiction 4 Stages



- Learning the high
- Seeking the high
- Preoccupation with the high
- Using drugs to feel normal

“Drugs, Drinking and Adolescents”, - I. MacDonald, M.D.

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Learning the high



Feelings	Sources	Behavior	Frequency
Feel Good; Few consequences	Friends	Minor detectable change; lying	Progresses to weekend use
Example: Teen at a party or “hanging out”			

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Seeking the high



Feelings	Sources	Behavior	Frequency
Excitement and then guilt	Buying	Drop hobbies, change friends, change dress, school deterioration – skipping, changes in mood, more lying	4 – 5 times per week, some solo use: no negative consequences perceived

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Preoccupation with the high



Feelings	Sources	Behavior	Frequency
Euphoric highs, severe shame, guilt, depression, suicidal thoughts	Selling	Family fights, stealing, school failure, expulsion, job loss, depression, anxiety, excessive piercing	Daily, frequent solo use

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Using drugs/alcohol to feel normal



Feelings	Sources	Behavior	Frequency
Chronic guilt, shame, remorse, depression, frequent suicidal thoughts	Any way possible	Physical deterioration (weight loss, chronic cough) severe mental deterioration (memory loss), paranoia, depression anxiety, extreme anger, school dropout, overdosing, suicide attempt	All day, every day

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Treatment



- If you suspect your teen may be using drugs visit: Substance Abuse and Mental Health Administration at www.findtreatment.samhsa.gov or call 1-800-662-help
- Lack of resources
- Get an evaluation by a substance abuse counselor
- Family needs treatment
- Intensive outpatient programs
- Inpatient treatment if suicidal; if comorbid psychiatric disorder; if risk of severe detox or comorbid medical disorder
- Psychiatric evaluation for comorbid anxiety, depression, mood swings, suicidal. Treat both at same time.
- For over 18 years old – Sierra Tucson

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Long term treatment programs



- Bridges to Recovery in Los Angeles
- Cottonwoods in Tucson for Females, Chemical and Behavioral program 90 days.
- The Waypoint Group (Thomas Winkle 602-952-8622) Adolescent Coalition
- Dr. Phil recommends: Youth Care Residential Treatment Center for Troubled Teens. <http://www.youthcare.com/>

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After Treatment



- Follow up crucial
- 12 step program
- Changing peer group
- Parents to follow through
- After 18 years old may use halfway houses

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Non-Medical Use of Prescription Medications



- Definition
 - “Taking a medication with out a legitimate prescription, or taking a prescribed medication in a way that is inconsistent with a doctors prescription, like using too much or too frequently”

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“Sharing and Selling of Prescription Medications in a college student sample” Garnier et al J Clin Psychiatry. 2010 Mar;71(3):262-9.



- Background
 - Almost $\frac{1}{4}$ of College Student do this at least once in their lifetime.
 - ADHD medications and prescription Opiates most commonly used in a non medical context.
 - Most common source among College Students – Friends and Peers
 - Users who obtain the drugs from peers are at increased risk for alcohol abuse, illicit drug abuse, heavy drinking, alcohol related problems.

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Sharing and Selling of Prescription Medications



- Prevalence of selling prescriptions – 7.3% to 18.6% in adolescents, 7th – 12th grade
- Estimates of similar samples sharing medications ranged from 10.9% to 24%
- Up to 1/3 of middle and high school students taking prescription stimulants have been approached to divert their prescriptions.
- In adult drug users in treatment selling their prescription: 5% - 34%
- 44% of adults with prescriptions for Methylphenidate diverted it in the past month.

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Sharing and Selling of Prescription Medications



- Survey of college students taking prescription medication – 27% purchased, sell, traded or gave it away.
- Those who had prescription stimulants were most likely to be approached (54%)
- Adolescent girls more likely than boys to share or give away prescription medication
- One study of young adults with ADHD found those who diverted prescription stimulants had comorbid conduct disorder or substance abuse disorder.

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Willens Et. al JAmACAD Child Adolescent Psychiatry. 2006

Sharing and Selling of Prescription Medications



- Objective
 - Estimate the prevalence of prescription medication diversion amongst college students.
 - Compare classes of medications
 - Most common methods of diversion
 - Characteristics of students who diverted medication

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Sharing and Selling of Prescription Medications



- Method
 - Analysis of personal interview data between 8/06 and 8/07
 - Part of ongoing launched in the study
 - Students between 17 and 19 years old had steady onset
 - Large public university in mid Atlantic region

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- Results
 - Among 483 students prescribed medication, 35.8% diverted at least once in their lifetime.
 - Most commonly diverted:
 - ADHD medication 61.7%
 - Prescription Analgesics 35.1% diversion rate
 - Sharing is the most common method of diversion
 - 33.6% students sharing their medications
 - 9.3% selling their medication in their lifetime
 - Medication diverters had more illicit drug use in the past year and more childhood conduct problems

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- Amphetamine accounted for more than half (62%) of diverted ADHD meds
- Diversion was a fairly infrequent occurrence with many sharing only once or twice in their life time.
- Small minority share regularly (1.9%) and or sold regularly (0.6%)
- Sharing was more common than selling 33.1% shared with their friends and 9.3% selling.

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- Correlates of diversion
 - Being male, living off campus, Having alcohol use disorder, Using illicit drugs or prescription drugs non-medically, Having a history of childhood conduct problems
 - Alcohol use disorder 46%, almost twice as high as general population.

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- Highest rate of diversion of ADHD meds – 61.7%; Analgesics 35.1%; other psychotropic meds 13.8%; asthma meds – 12.7%

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- Because Analgesics were prescribed to the greatest number of people, there were more individuals diverting prescription analgesics than prescription ADHA medication.

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- This Study identified 3 classes at risk for diversion:
 - Students prescribed ADHD Meds
 - Students with conduct problems
 - Non Medical users of prescription drugs
 - All 3 of these categories obtain their meds through primary care clinicians or psychiatrists
 - Doctors and mental health clinicians need to discuss the dangers of diversion; especially monitor high risk patients

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- High school and college students with ADHD need to be educated that their medications will be in high demand. Caution against diversion.
- Prescribers need to ask patients how often they actually take their medications and prescribe a number to meet their usage.
- Lower abuse and diversion with extended release and non stimulant meds.

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- Sharing – most common method of diversion, motivated by social reasons such as being “nice” to their friends
- Link between marijuana use disorder – skipping class, low academic performance and non medical use of stimulants as a compensatory mechanism.
- Perhaps students are unaware of the legal and medical consequences of diverting prescriptions they think are helpful


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Neuro Enhancement on the College Campus



- Reported on 60 Minutes, April 23, 2010
- Dr. Santos studied sophomores at the University of Kentucky.
 - A sample of 2000 students
 - 34% had taken stimulants illegally
 - Junior and Senior students use more frequently in the 50 – 60% range
 - In a sorority 80% had used

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- Common practice for students to stay up all night doing papers and using these drugs to “lift the edge”
 - Students reported it can make them study harder, stay awake longer, have more motivation and more attention to detail
 - Makes the work easier to understand

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- Stimulant prescriptions are written for 4% of the students
- Frequently not used to their entirety
- Extra pills are sold to peers at a cost of \$3 to \$5 per pill
- 43% said that the use of stimulants increased their grade by one level.

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- 40% said it increased their grade by 2 levels – namely a C grade to an A grade
- Most dangerous form is when they are smashed and snorted
- Can lead to addictions, psychosis, hypertension, cardiovascular diseases, heart attack and stroke.

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- Dr. Ferra, University of Kentucky, published an article in Nature in 2009.
- Looking at new methods to improve the ability to learn.
- Very controversial but she says that it is the wave of the future – helping people to use their brain in a more expansive productive way.
- Moral question posed to students: “Do you feel it is appropriate to use drugs to enhance your performance?” Many students felt it was OK to do so and “why not?”

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- Provigil was used last year by 2 million people as a performance enhancer.
- Air Force Pilots are now allowed to use it for extended combat flights.

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Recommended Precautions



- “Lock Your Meds” – Nashville Family Partnership. Visit: <http://www.lockyourmeds.com> or call (305) 856-4886, (Toll Free) 800-705-8997

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- Pharmacists may consider posting a warning:
“It is dangerous to share prescription drugs with family and friends. It can lead to drug abuse and serious complications including death.”



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Non-Medical Use of Prescription Medications



- Summary:
 - Adolescent substance abuse continues to be a major concern. Peer influence and time structure are crucial factors
 - Sharing and selling medications is a serious growing problem in young adults and in adults.
 - Mental health clinicians and physicians need to be vigilant – question, educate and caution their patients about the risk of sharing and selling their medications