

Adolescent Substance Abuse

WHY IT'S A PROBLEM AND WHAT WE NEED TO KNOW AS ANESTHESIA PROVIDERS

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Outline

- Statistics on adolescent substance abuse
- Review the most commonly abused substances
- Anesthetic implications of substance abuse

Disclosures

- No financial disclosures

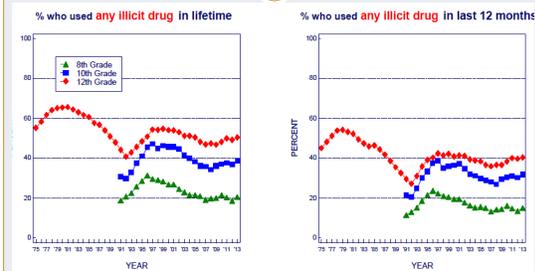
Case 1

- A 17 yo presents to the OR for ORIF of an open radial fracture sustained in a MVC. The patient is restless with a HR of 150, has vomited once, and appears very anxious. He was driving home from a friend's house. He denies taking any illegal substances.

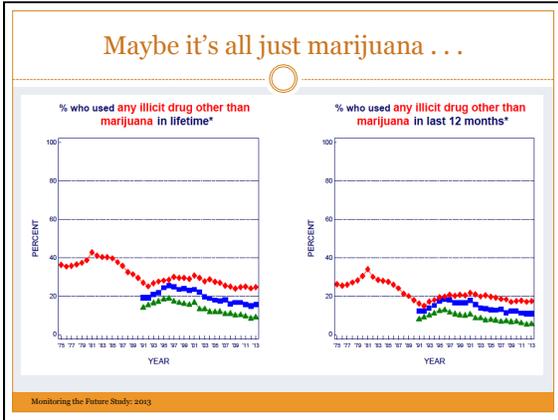
Case 2

- An 18 yo girl presents for a lap appendectomy after a 2-day history of nausea, vomiting, and lower abdominal pain. In the recovery room the patient is writhing in pain despite receiving 4 mg of hydromorphone. Her temperature is 38.8 degrees celsius, HR 120, and she appears very agitated.

Are kids really using drugs that often?



Monitoring the Future Study, 2013



What drugs are adolescents using/abusing?

Substance	% of 12 graders reporting use in the past year
Alcohol	62.0%
Marijuana	36.4%
Amphetamines	8.7%
Narcotics (excluding heroin)	7.1%
Hallucinogens	4.5%
Cocaine	2.6%

Monitoring the Future Study: 2013

- ### It's marijuana, its harmless . . .
- More likely to get in an automobile accident.
 - Adolescent use results in an 8 point decrease in adult IQ that did not normalize when use stopped.
 - All the adverse pulmonary effects of cigarette smoke and more
 - Increased HR for up to 3 hours after use
 - Decreased motivation, decreased educational achievement, and increased risk of mental health issues.
- <http://www.drugabuse.gov/sites/default/files/drugfactmarijuana2014.pdf>

Anesthetic consideration for the marijuana user

- Acute use can cause uvulitis and may cause post op airway obstruction
- Acutely can cause sympathetic surge so avoid other drugs that may potentiate sympathetic nervous system (ketamine, ephedrine)
- Acute users may experience psychiatric side effects during both induction and emergence
- Chronic users may have depletion of catecholamines
- Treat chronic users like chronic smokers

Nguyen, HT. Cannabis (marijuana) and anesthesia. Anesthesiology Rounds. Vol.5, Issue 9

Did you see this commercial?



15% of adolescents report abusing prescription drugs



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Prescription Drug	% of 12 th graders reporting use in the past year
Adderall	7.4%
Vicodin	5.3%
Oxycontin	3.6%
Ritalin	2.3%

Monitoring the Future Study: 2013

10-Fold Increase in Stimulant Rx's Dispensed by US Retail Pharmacies 1991-2010

Total Number of Prescriptions for Stimulants* Dispensed by U.S. Retail Pharmacies, 1991-2010
*excludes modafinil and atomoxetine products

Year	Total Market (millions)	Methylphenidate (millions)	Amphetamine (millions)
91	4	0	0
92	6	0	0
93	7	0	0
94	10	0	0
95	13	0	0
96	15	0	0
97	16	0	0
98	17	0	0
99	18	0	0
00	20	0	0
01	21	0	0
02	24	0	0
03	24	0	0
04	27	0	0
05	28	0	0
06	30	0	0
07	33	0	0
08	36	0	0
09	39	0	0
10	44	0	0

Source: EDI's Vector Group, National (VGM)

Prescription Drugs: Abuse and Addiction, NIDA Research and Report Series

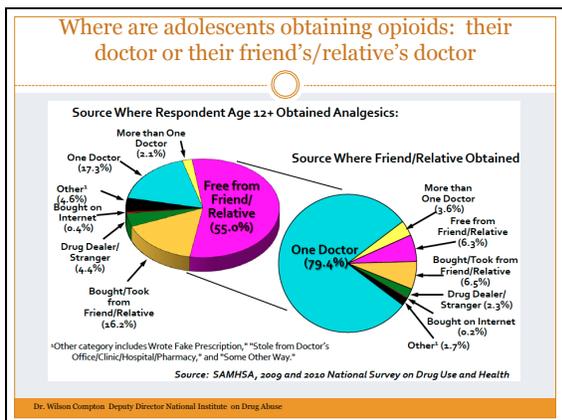
3-Fold Increase in Number of Opioid Rx's Dispensed by US Retail Pharmacies, 1991-2010

Total Number of Opioid Prescriptions Dispensed by U.S. Retail Pharmacies, 1991-2010

Year	Number of Opioid Rx's (millions)	Hydrocodone (millions)	Oxycodone (millions)
91	76	0	0
92	78	0	0
93	80	0	0
94	82	0	0
95	84	0	0
96	86	0	0
97	88	0	0
98	90	0	0
99	92	0	0
00	94	0	0
01	96	0	0
02	98	0	0
03	100	0	0
04	102	0	0
05	104	0	0
06	106	0	0
07	108	0	0
08	110	0	0
09	112	0	0
10	114	0	0

Source: EDI's Vector Group, National (VGM)

Prescription Drugs: Abuse and Addiction, NIDA Research and Report Series



- ### Anesthetic considerations for the opiate abuser
- When managing acute opiate intoxication, try to avoid antagonist therapy if possible. May precipitate acute withdrawal and make anesthesia and post-op analgesia even more challenging
 - Difficulty achieving effective analgesia – maximize non-opioid analgesics
 - Opioid tolerant patients need 2-3 times the dose of a opiate naïve patient, yet they are still at risk for respiratory depression
 - Be vigilant and reassure patient that withdrawal symptoms will be treated
- Vaghari, B et al. Perioperative Approach to Patients with Opioid Abuse and Tolerance. Anesthesiology News, June 2012; 1-4

- ### Opiate withdrawal symptoms
- CNS hyperactivity, anxiety
 - Rhinorrhea
 - Nausea/vomiting
 - Muscle aches
 - Fever and sweating
 - Tachycardia
 - Hypertension
 - Diarrhea
 - Insomnia
- Mitra, S, et al. Perioperative Management of Acute Pain in the Opioid-dependent Patient. Anesthesiology 2004; 101: 212-27

Anesthetic considerations for the stimulant abuser:
acute intoxication

- Amphetamine is a powerful CNS stimulant with peripheral alpha and beta actions
- Increased BP with possible reflex bradycardia
- Increased anesthetic requirements
- Case report of severe intraoperative intracranial hypertension with neurologic sequelae

Holzer, SP, et al. General Anesthesia in a Patient on Long-Term Amphetamine Therapy: Is There Cause for Concern? *Anesth Analg* 2006; 91: 298-9.

Anesthetic considerations for the stimulant abuser:
chronic use/abuse

- Chronic use will deplete catecholamine stores
- Decreased anesthetic requirement
- Decrease the sympathetic response to hypotension (case report of arrest on induction of anesthesia)
- Chronic users develop tolerance which can manifest as depression and fatigue
- Intra-op diminished response to ephedrine
- Takes weeks to replete CNS catecholamine stores.

Perruchoud, C, et al. Cardiac Arrest during induction of anesthesia in a child on long-term amphetamine treatment. *Br J Anaesth* 2008; 100: 421-2

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Case 1

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- Patient attended a 'pill party' and ingested an unknown amount of prescription stimulant (ADHD medication).

Case 2

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- Patient has been taking Oxycontin that she stole from her grandfather's medicine cabinet as well as purchasing it on the street for the last 4 months.

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<http://www.drugabuse.gov/sites/default/files/drugfactsmarijuana2014.pdf>
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