

Youth Substance Use Disorders: Development, Gateways of Risk, Treatment

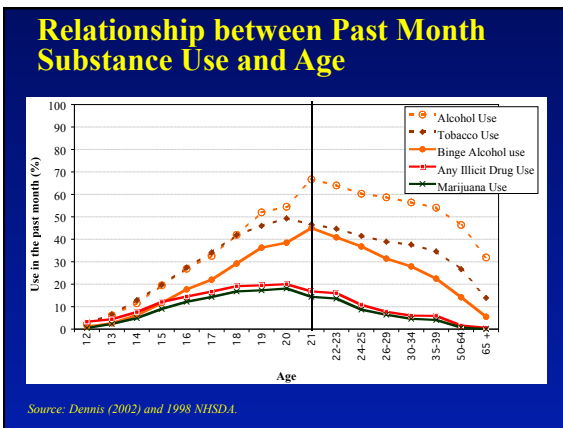


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Part 1: The adolescent brain and gateways of risk

- Overview of adolescent developmental vulnerability
- Perspectives on development
 - The teen brain: Lessons from biology
 - Self-regulation: Lessons from affective psychology
 - Underlying component mechanisms: Lessons from cognitive science
- Marijuana as example of potential gateway
- How does this inform practice? Developmentally informed interventions

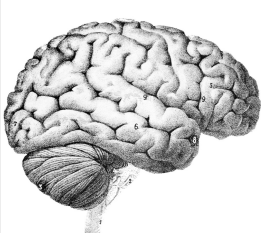
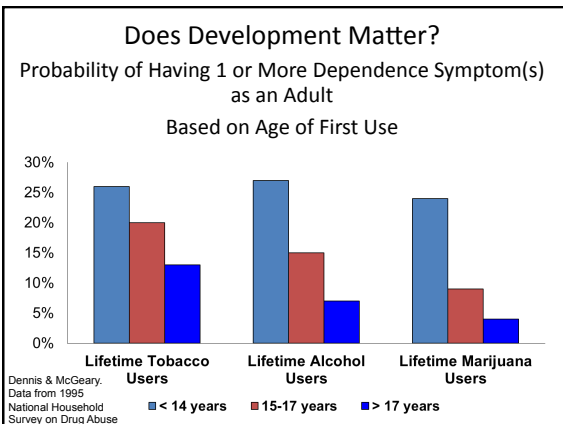


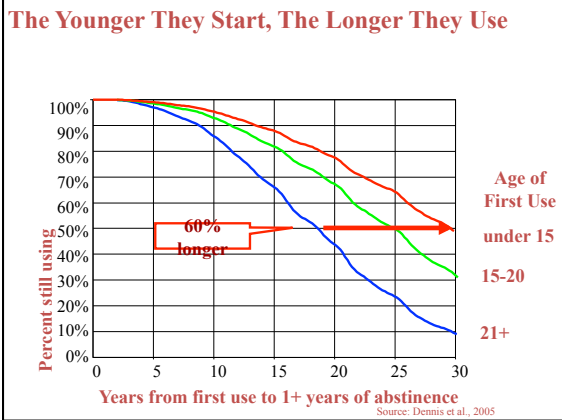
Some things never change

“We live in a decadent age.
Young people no longer respect their parents.
They are rude and impatient.
They frequent taverns and have no self-respect.”

Inscription on Egyptian tomb circa 3000 BC

Developmental Vulnerability

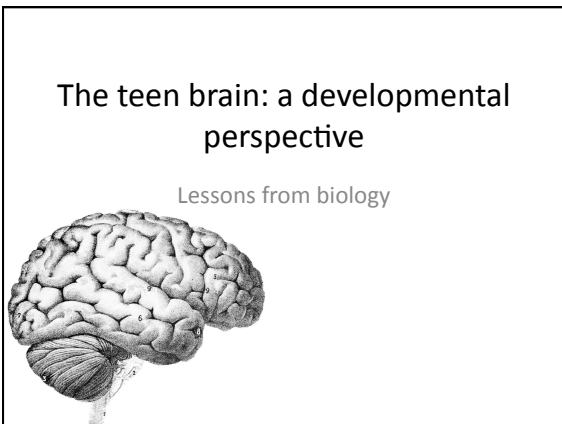





- Adolescents have different courses of SUD**
- Adolescents smoke fewer cigarettes overall than adults, but have higher rates of dependence for the same levels of use
 - Exposure to Marijuana leads to 2-4x the rates of dependence in adolescents compared to adults
 - Adolescents may have different progressions (dependence before abuse) because of different thresholds of functional impairment

- Never Forget Development**
- Maturation is a process
 - Slow
 - Individual variation
 - Incongruity across domains
 - Expect deviation of normal trajectory

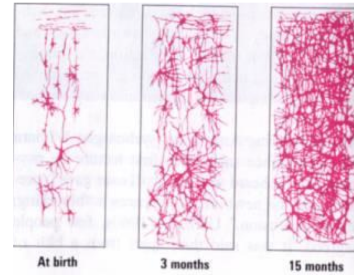
- Developmental perspectives**
- Genetics
 - Exposure
 - Learning
 - Gateway hypothesis
 - Resilience and functional reserve
 - Brain development
 - Cognition
 - Emotion



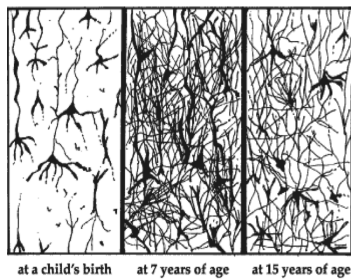
Adolescent Brains and Development

- Functional development through maturation and morphology
- Dynamic change through age 25
- Synaptic connectivity through experience

Proliferation



Pruning

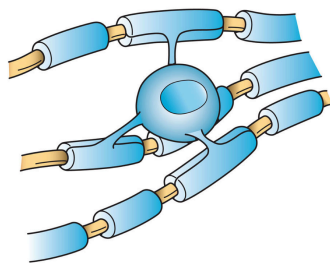


Pruning

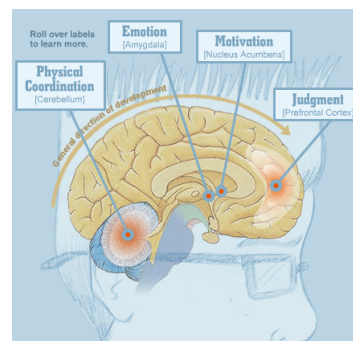
- Pruning takes raw material potential and refines it to particular functional pathways



Myelination



Developmental Order



Developmental Problems Where Does it Show?

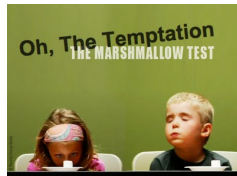
- Delays in self-regulation
- Emotional responses: hypertrophy and immaturity
- Heightened reward sensitivity → increased adventurousness and excitement-seeking
- Immaturity in motivation
- Different sensitivity to intoxication
- Delays in executive function (i.e. inhibitory processes)
- Treatment = habilitation, not rehabilitation

What is Self-Regulation and Why Should We Care?

- To be able to control oneself
 - to fulfill self-directed intention
 - to improve function and health
- Paradigm of temptation and its resistance is broadly related to fundamental processes preceding substance use and later including substance use
- These processes are immature in adolescents
- These processes are impaired further by substance use

Stanford Marshmallow Experiment

- Important body of work by Walter Michel
- Intrinsic inhibitory control and capacity for postponement of gratification



Marshmallow test



Role of Emotion

- Salience of emotion
- Magnitude of emotion
- Sense of emotional insight

Emotional insight?



Adolescent Emotions: The Real Deal

- Poor affective regulation
- Limited repertoire
- Filter of perceived hostility
- Disproportionate affective processing over cognitive
- Disconnect between perceived affective capacity and actual impairment

Maturational Trajectory of Emotion Regulation

- Hard-wired responses
- Expansion of repertoire of emotional response
- Improved emotion recognition
 - Awareness of the internal emotional environment
 - Awareness of emotional responses in others
- Improved emotion control: hidden expression, suppression, enhancement
- Expected part of maturation to be able to manage emotions – “big girls don’t cry”
- Learning emotional strategy
- Active rehearsal

Severe Mood Dysregulation

- Major body of work by Ellen Leibenluft
- Persistent syndromic cluster of traits, relatively stable over time
- Characterized by severe nonepisodic irritability (marked reactivity to negative emotional stimuli), dysphoric mood between outbursts, hyperarousal
- Overlap with major depression, anxiety, ADHD, ODD
- Not bipolar disorder

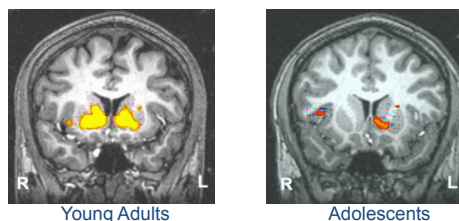
This should not be a surprise



Motivation and Reward

- Enhanced adventurousness and excitement seeking
- Underdeveloped capacity to delay gratification
- Decreased salience of anticipated future reward – delayed discounting

Decreased Motivational Anticipation in Adolescents



- Ventral striatum: involved in motivational circuitry that energizes approach towards reward
- Different levels of activity in anticipation of reward
- No differences (not shown) when reward accomplished

-Bjork et al. J Neuroscience 2004

Adolescents have different sensitivity to alcohol intoxication

- Compared to adults, adolescents show
 - Decreased dysphoria with hangover
 - Decreased sedation, motor impairment with acute intoxication
 - Increased social facilitation with intoxication
 - Increased memory disruption

Component building blocks Cognitive maturation and working memory

- Working memory – ability to manipulate small amounts of information for short periods to facilitate a goal
- Essential building block for many higher cognitive processes including executive function
- Immature in adolescents
- Impaired in adolescent substance users

Immaturity of Executive function

- Underdeveloped capacity for weighing priorities and planning ahead
- Disinhibition
- Metaphor - lots of acceleration, sleek shiny and sexy, handling ok, but no brakes

Antecedent Vulnerability of Emotional Dysregulation

- Common examples of difficulties preceding onset of substance use –
“my child has always had this trouble”
- Intersecting vulnerabilities
 - Impulsivity
 - Lability and moodiness
 - Over-reactivity and tantrums
 - Poor frustration tolerance
 - Irritability and anger

Executive Function: Interference and Impulse Inhibition

Name these colors:

Yellow


Green

Blue

Red

Executive Control Delay discounting

- What's better –
 - \$100 today or \$110 next year?
 - \$100 today or \$110 next week?
 - \$100 today or \$500 next week?

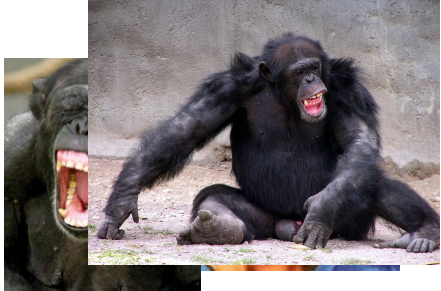


Phineas Gage Meets a Railroad Pike

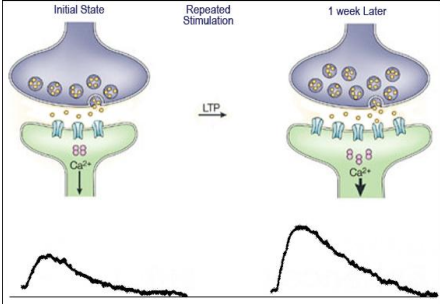
...fitful, irreverent, indulging at times in the grossest profanity... manifesting but little deference for his fellows, impatient of restraint or advice when it conflicts with his desires, at times pertinaciously obstinate, yet capricious and vacillating, devising many plans of future operations, which are no sooner arranged than they are abandoned...

--Harlow. 1866

The Stimulus-Bound Chimp

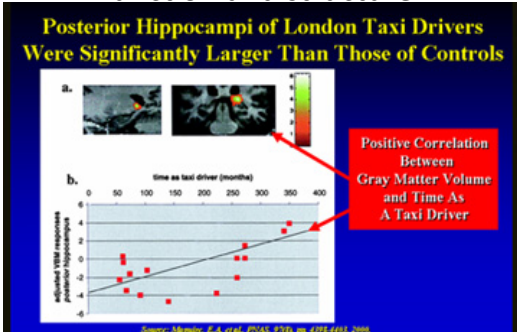


Long term potentiation
We get better at what we do



Experience influences brain function and structure

Posterior Hippocampi of London Taxi Drivers Were Significantly Larger Than Those of Controls



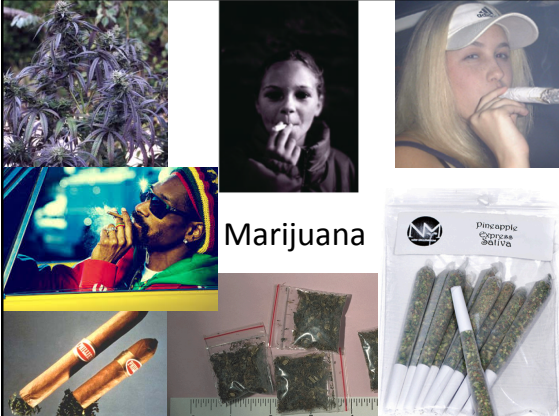
Positive Correlation Between Gray Matter Volume and Time As A Taxi Driver

Source: Maguire, E.A. et al. PNAS 101, pp. 4161-4163, 2004

The Gateway hypothesis
Stages of increased exposure and risk

- Each milestone confers progressive exposure to risk and progressive likelihood of progression
- Substance A → substance B → substance C
- Possible explanations:
 - Effect of substance
 - Progression of addictive process and time course
 - Access to substance
 - Exposure to using peers

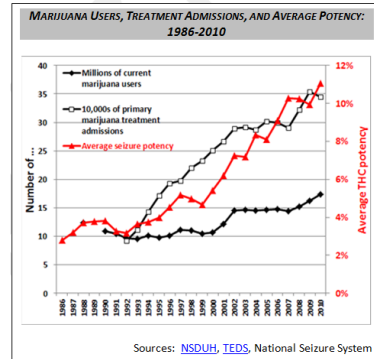
Marijuana



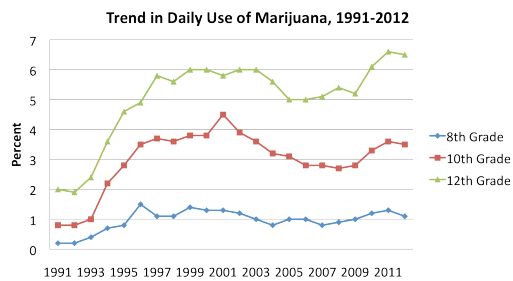
Why do we care about MJ?
What's all the fuss?

- Vulnerable populations: youth, psychiatric illness, other substance use disorders
- Consequences of intoxication, eg MVCs
- Psychiatric consequences of use
- Progression to MJ use disorders and other substance use disorders

Use, treatment presentation, potency

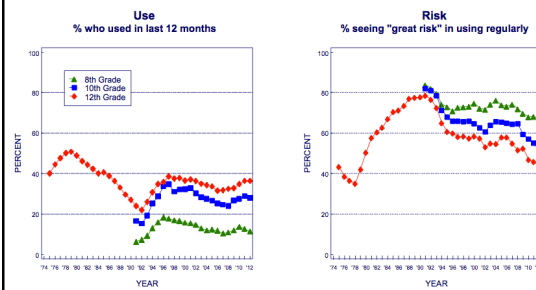


Cannabis - Trends

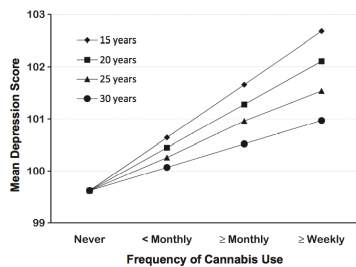


Adolescent Use and Attitudes

MTF study 2012



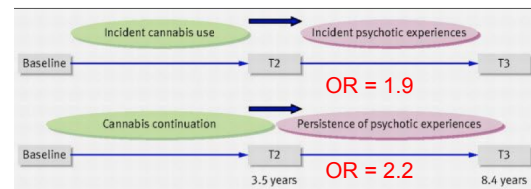
MJ use associated with depressive symptoms



Pooled data, 4 longitudinal studies, n=6900
Horwood et al. Drug and Alcohol Dependence 126 (2012) 369-3

Cannabis and psychosis
Prospective exposure cohort study

- 10 yr prospective cohort of 1923 German youth (14-24 at baseline)
- Examination of change over 3 time points



Kuepper et al British Med J. 2011

Cannabis and cognitive impairment

- IQ measured age 13, 38; N=1037
- MJ use measured age 18, 21, 26, 32, 38
- IQ decline associated with regular use and dependence, dose response related to persistence

**CAUTION
MEMORY LOSS
AHEAD**

	None	Some use	1 wave	2 waves	3+ waves
Regular use	+1	-1	-3	-2	-5
Dependence	+1	-1	-2	-3	-6

- No difference with controls for education, recent use, other substances, schizophrenia
- Adolescent onset worse, -8 points for 3+waves

Meier et al. PNAS. 2011

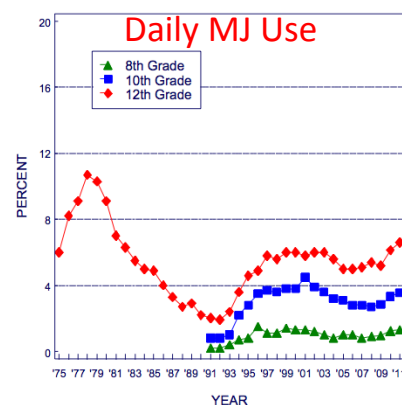
Medical cannabis dispensaries



Vulnerability in youth

- Conditional risk of use disorder in adolescents as high as 40%
- Daily use of MJ <age 17 associated with substantially increased risk of:
 - Persistent MJ Dependence (OR=18)
 - High school drop out (OR=3)
 - Use of other drugs (OR=8)
 - Suicide attempts (OR=7)

Pooled longitudinal studies. N =2537 to N=3765.
Silens et al. Lancet Psychiatry, 1, 286 – 293, 2014S



Messaging - Overcoming societal attitudes

- MJ is addictive (but not everyone gets addicted)
- MJ can be harmful (but not everyone gets harmed)
- Broader use leads to broader **problem** use through access and decreased perceived harm
- This is a huge problem for youth and other vulnerable populations
- How to respond to MJ as medicine, as normative consumer product?
 - Medicalization (analogy: US prescription opioid epidemic)
 - Recreational commercialization (analogy: alcohol)

Low perceptions of harm

The public conversation

- We have too easily been cast in the role of puritanical prohibitionists
- We are concerned with **problem use**
- Where is the discourse on the trade off between easier access for the non-impaired vs alarming risks for youth (and other vulnerable populations)?
- Where is the discourse on treatment?

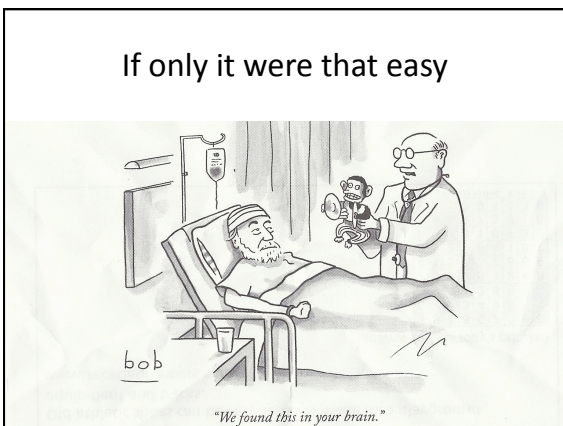


Part 2: Overcoming vulnerability and improving treatment

- General treatment overview
- Marijuana
- Co-occurring disorders
- Opioid addiction

Interventions and clinical implications:

How can we respond to the adolescent brain?



The Adolescent Brain: Clinical Implications

- Useful metaphor that contains description, explanation, and oversimplification
- Sound bite that conveys:
 - Adolescents are different and special
 - It's real! – expectation of typical patterns
 - There's a reason – cartoon of mechanism
- Unintended consequences
 - Stereotypes, lowering of expectations
 - Limitation of responsibility – it's not me it's my brain

Instructions for parents (and treatment staff)

- A user's manual for your adolescent
 - Roadmap through potential chaos
 - Set expectations more appropriately
 - Depersonalize – it's not all malicious volition
 - Alter responses to be more effective

Tried to make me go to rehab

- Treatment = habilitation, not rehabilitation
- Reconsider **"Just grow up!"**

Welcome to planet teen!!

- We are all just visitors here
- Realize you're an alien in their eyes: "one of them"
- Learn the language and customs
- Appreciate the culture

Interventions: Specific examples

- Encourage adolescents to formulate solutions: Practice is crucial
- Natural consequences: Give 'em enough rope (but not too much)
- Don't take the bait
- Cognitive training: WM and executive function
- Emotion regulation training
- Address sleep deprivation
- Skills rehearsal

Practical Treatment Approaches

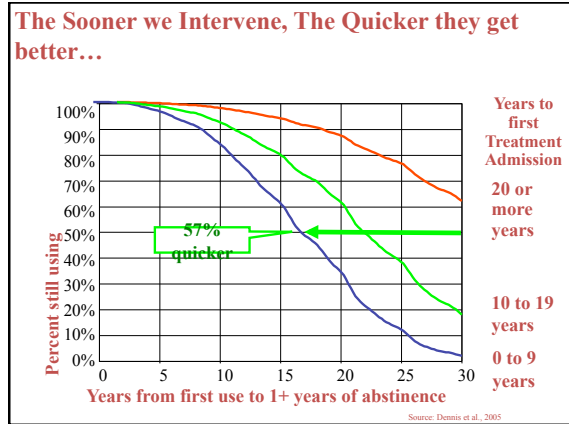
- 95% is just showing up

Developmentally Informed Treatment Practical Approaches

- Learning to celebrate who I am and who I will be

Developmentally Informed Treatment Practical Approaches

- Remember that adolescents rely on the support of adults, but also acknowledge striving for autonomy
- Emphasize adolescent learning styles, using energetic and fun activities while preserving therapeutic content
- Management of disruptive behavior is expected and essential, balancing limits and looseness
- Acknowledge normative attraction of thrill-seeking, risk, deviance
- Emphasize rewards and praise
- Emphasize prosocial alternatives to drug use
- Weave a safety net of supports: families (or surrogates), but expect disdain
- Relationship, relationship, relationship....



Some Evidence Based Substance Abuse Treatment Modalities

- Motivational enhancement therapy (MET)
- Cognitive behavioral therapy (CBT)
- Adolescent Community Reinforcement Approach
- Residential treatments, including short term acute and long term Therapeutic Community
- Strategic family therapies (MDFT, BSFT, MST)
- Contingency management
- Community interventions (assertive, school-based, home-based)
- Psychiatric assessment and treatment, including medications as needed
- Juvenile justice mandate and collaboration
- 12 Step induction

Motivational Enhancement Therapy

- Uses principals of motivational interviewing
- Emphasizes motivation and preparation for change
- Functional analysis, decisional balance, pro's and con's
- Goal setting

Treatment Engagement and Stages of Change

- Progressive treatment engagement
- Relationship and therapeutic alliance
- Motivational enhancement

Motivational approaches

- Do you know other kids who have been in trouble...
- Do you know why I or your parents might think it's a problem...
- What are the pro's and con's for you...
- What would be evidence in your view that it's a problem...
- If you could stop anytime, would you be willing to see what it's like...
- Let's schedule you to come back and see how it's going...

Cognitive Behavioral Therapy (CBT)

- Examination of connection between thoughts, feelings, and behaviors
- Emphasis on skills rehearsal
- Analysis of antecedents to use
- Prevention of progression from lapse to full relapse
- Cue reactivity: recognition, avoidance, and desensitization

Some typical CBT sessions

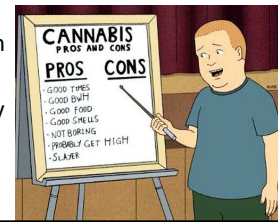
- Refusal skills
- Improving your social support network
- Increasing pleasant activities
- Relapse prevention
- Planning for emergencies and coping with relapse
- Managing thoughts about using
- Coping with cravings and urges
- Problem solving
- Communication skills
- Anger awareness
- Anger management
- Coping with depression

Families

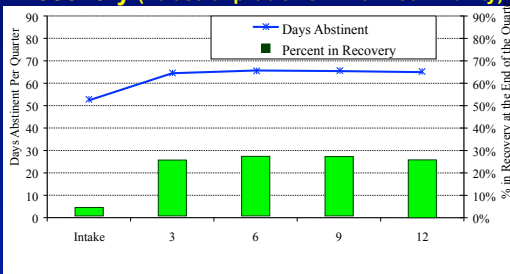
- Monitoring and supervision
- Modeling of prosocial behaviors
- Support for treatment
- Communication and negotiation
- Difficult balance of zero tolerance and accommodation of normative experimentation
- We need to work hard to engage families

CYT - standard psychosocial treatments

- Motivational enhancement / cognitive behavioral therapy (MET/CBT)
- Adolescent community reinforcement approach (ACRA)
- Multidimensional family therapy (MDFT)

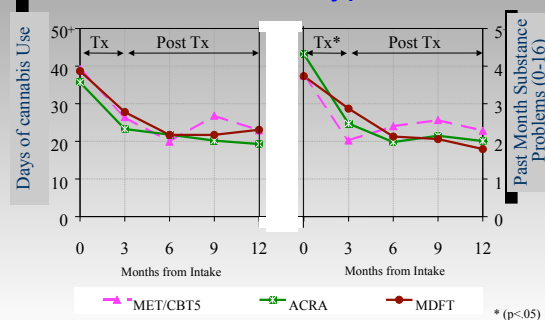


Cannabis Youth Treatment (CYT) Increased Days Abstinent and Percent in Recovery (no use or problems while in community)



Source: Dennis et al., 2004

Alternative Arm Outcomes: Does Treatment Type Matter?

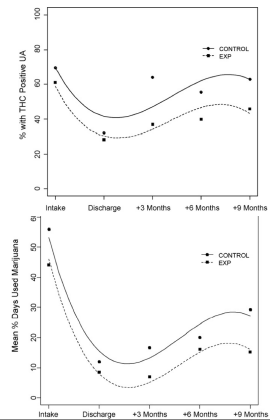


Other psychosocial treatment The seven challenges

- We decided to open up and talk honestly about ourselves and about alcohol and other drugs.
- We looked at what we liked about alcohol and other drugs, and why we were using them.
- We looked at our use of alcohol or other drugs to see if it has caused harm or could cause harm.
- We looked at our responsibility and the responsibility of others for our problems.
- We thought about where we seemed to be headed, where we wanted to go, and what we wanted to accomplish.
- We made thoughtful decisions about our lives and about our use of alcohol and other drugs.
- We followed through on our decisions about our lives and drug use. If we saw problems, we went back to earlier challenges and mastered them.

Contingency management

- CM for abstinence, parent training for home CM, parental incentives for adherence, MET/CBT; vs MET/CBT + CM for attendance; 14 wks
- Improvements in rates of 8 wks abstinence during but not after treatment, improvement in days of use persistent



Approaches based on integrated delivery

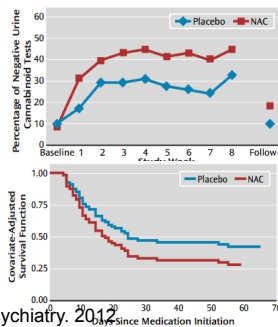
- Student assistance
- Juvenile justice linkage
- Mental health linkage
- Primary care SBIRT

Pharmacotherapies

- NAC
- Gabapentin
- Agonist substitution (dronabinol)
- Sleep remediation
- Antagonists

N-acetyl cysteine

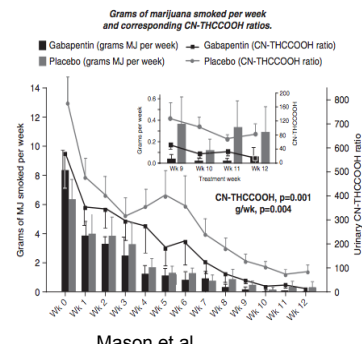
- Improves glutamate homeostasis
- RCT, n=116 youth, 8 wks + counseling + CM, 1200 mg bid
- Improves % neg uds, time to neg uds (trend), incidence neg uds, 2-wk abstinence end of trial



Gray et al. Am J Psychiatry. 2012

Gabapentin

- Improves GABA homeostasis, sleep, anxiety
- N=50 adults, 12 wks + counseling, 1200 mg/d
- Decreases in amounts of use, days of use, withdrawal sx's, problems and cognitive function



Mason et al.

Dronabinol

- Agonist substitution strategy
- RCT, n=156 adults, 12 wks + counseling, 20 mg bid
- Improvements in retention, withdrawal
- No improvement in 2 wk abstinence end of trial, days of use, amount of use
- Further work with potentially complimentary Rx: lofexidine, guanfacine, others

Levin et al. Drug Alc Depen. 2011.

Sleep remediation

- Insomnia a prominent feature of MJ withdrawal
- Insomnia correlated with relapse
- Attention to insomnia improves alcohol treatment outcomes
- Medication can improve insomnia and partially restore sleep architecture in MJ withdrawal

Vandrey. Drug Alcohol Depend, 2011. 117(1): p. 38-44.

Antagonists

- CB1 antagonist rimonabant: unfavorable side effect profile
- Other antagonists in development
- Long acting formulations might have potential

SBIRT

- Efficiently identify and stage cases
 - Simple questions
 - CRAFFT
 - BSTAD
 - How many times used MJ past 12 months?
 - ASSIST-Lite
 - Any MJ use past 3 months?
 - Any urge to use $\geq 1x/wk$
 - Anyone expressed concern about your use?
 - Computerized tools
- Hopefully engage patients and clinicians
- Hopefully lead to effective interventions

SBIRT

- BI (computer) reduces initiation and post-initiation progression of MJ use
 - Marsch et al *Adolesc Med State Art Rev.* 2007.
- BI and assessment control reduces lower severity MJ use (from < weekly to < monthly)
- BI (computer or therapist) shows promise in modest, *short-term* reductions in MJ problems
 - Walton et al. *Drug Alc Depend.* 2013.
- But BI's *alone* generally not effective long-term, and not for higher severity

SBIRT

- Alarming poor linkages
- Need models for reciprocal linkages and warm handoffs back and forth

Extra active ingredients – engagement, relationship, monitoring

- Physicians (eg primary care pediatricians) have enormous impact on patients and families
- Important to set clear standard: our stance should be that any intoxicant use is unhealthy for adolescents
- Longitudinal follow-up can hold up a mirror of dynamic change, both pos and neg
- Should be a natural and central touchpoint
- “Don’t ask don’t tell” is not an adequate strategy

Family empowerment

- We must empower families – we have no other choice
- Confidentiality and the autonomy of patients are important values but must not be barriers to health and success
- Appreciate burden
- Need menus and roadmaps and tools that leverage the natural power of families
- “I can help with the receptors and skills but you still have to parent your difficult teenager....”

**Future Directions
Adolescents and TECHNOLOGY**

It just makes sense ☺

Working Memory Impairment in MJ- and Opioid-addicted Youths

WMI scores	MJ	Opioid
Mean %ile	16	39
<50 th %ile	84%	70%
<25 th %ile	71%	35%
<10 th %ile	42%	17%

WMI = Working Memory Index

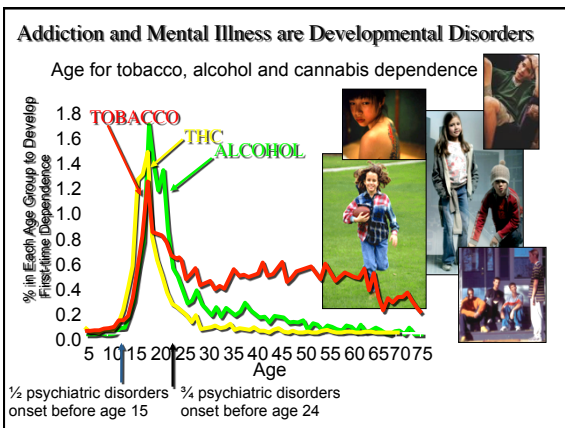
Using technology for neurorehabilitation

- WMI – CogMed
- Training for EF function

Technology: Avatar assisted therapy



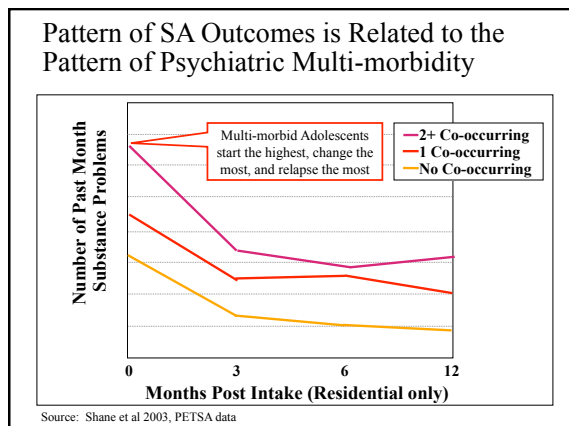
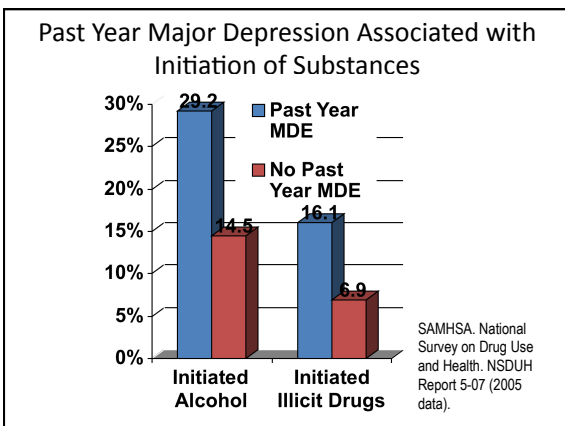
Co-occurring psychiatric disorders



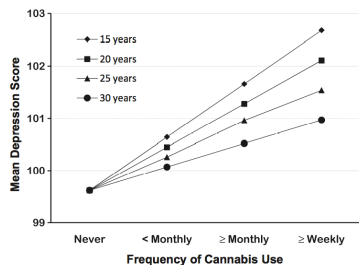
Dual Diagnosis

Cast the net wide

- High prevalence of co-morbidity
- Inclusion of symptoms and sub-syndromal problems without requiring formal diagnosis
- Pre-morbid, drug-induced, and drug exacerbated conditions
- Suspect co-occurring psychiatric disorders
- Treat co-occurring psychiatric disorders

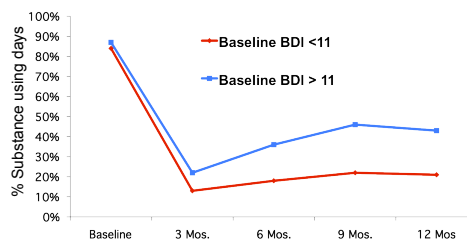


MJ use associated with depressive symptoms



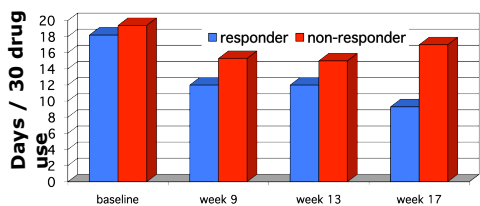
Pooled data, 4 longitudinal studies, n=6900
Horwood et al. Drug and Alcohol Dependence 126 (2012) 369–378

Depressive Symptoms Correlate with Substance Use Outcomes



Subramaniam et al. JAACAP. 2007.

Reductions in substance use associated with reductions in depression



Both Placebo (p<.0001) and Fluoxetine (p<.0003) Responders have significant pre-post reduction whereas Non-Responders in each group do not
Responders differ significantly from Non-Responders (p < .02)
Riggs et al.

Approaches to Treatment of Youth Opioid Addiction

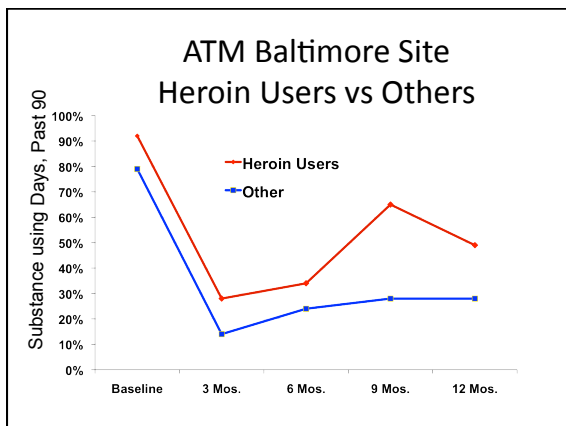
Prescription opioids
Heroin

What should we do with this case?

- 17 M
- Onset prescription opioids 15, progressing to daily use with withdrawal within 8 months
- Onset nasal heroin 16, injection heroin 6 months later
- 3 episodes residential tx, 2 AMA, 1 completed
- Suboxone treatment (monthly supply Rx x 4), took erratically, sold half
- Presents in crisis seeking detox (“Can I be out of here by Friday?”)

Youth opioid users Clinical experience

- Higher severity and worse outcomes than non opioid using counterparts
- High rates of AMA from residential
- Low rates of continuing care in outpatient
- Relapse and drop out as the rule
- Alarming rates of overdose and death
- Lack of consensus and coherent approach
- Emergence of increasing “deep end” high severity, high chronicity population



- ### Conceptual underpinnings
- #### One set of tools (among many)
- Use as many effective tools as are available
 - One size does not fit all: as many doors as possible
 - A full continuum of care: multiple services with flexible responses
 - Institutional affiliation promotes engagement
 - Expectation of relapsing/remitting course
 - Expectation of variable and shifting treatment readiness
 - Recovery as a gradual process, not an overnight event -- expectation of incremental progress

Effectiveness of Buprenorphine for Youth

Woody et al. JAMA. 2008

Extended vs Short-term Buprenorphine-Naloxone for Treatment of Opioid-Addicted Youth: A Randomized Trial

ORIGINAL CONTRIBUTION

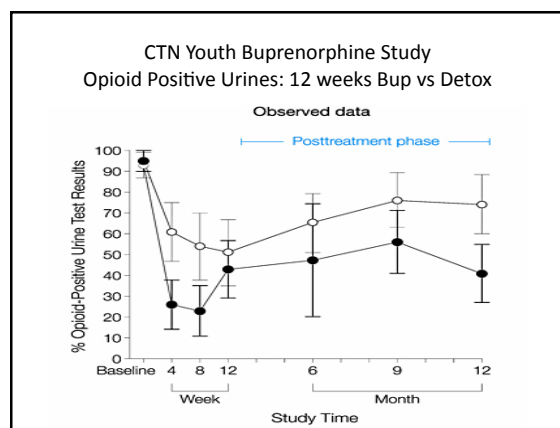
Context: The usual treatment for opioid-addicted youth is detoxification and counseling. However, evidence indicates that many may have relapsed.

Objective: To evaluate the efficacy of extending buprenorphine-naloxone for 12 weeks in detoxification for opioid-addicted youth.

Design, Setting, and Patients: Clinical trial at 6 community programs from July 2005 to December 2006 involving 150 patients aged 15 to 21 years who were randomized to 12 weeks (n=75) or 7 days (n=75) of treatment.

Interventions: Patients in the 12-week buprenorphine-naloxone group were prescribed 16 mg per day from day 1 to day 7 and then tapered to 16 mg on day 14. All other patients were prescribed 16 mg per day from day 1 to day 7.

Main Results and Conclusions: Twelve patients (16%) in the 12-week group relapsed within 12 weeks compared with 28 patients (37%) in the 7-day group.



Addiction
CASE REPORT

doi:10.1111/j.1360-0443.2010.02051.x

Treatment of opioid dependence in adolescents and young adults with extended release naltrexone: preliminary case-series and feasibility

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¹Johns Hopkins University School of Medicine, Department of Psychiatry and Behavioral Sciences, MD, USA; ²Mountain Manor Treatment Center, MD, USA; ³University of Cincinnati College of Medicine, Department of Psychiatry, OH, USA; and ⁴Lindber Center of HOPE, OH, USA

- 20 youth received xr-ntx
- 16 initiated OP treatment
- 10 retained at 4 months
- 9 “good outcome”

- ### Elements of treatment model
- Inpatient crisis intervention and medication induction with emphasis on ongoing linkage from detox to next levels of care (the revolving door should lead somewhere)
 - *Specialty* care with integration of relapse prevention medication as *standard of care*: Buprenorphine and Extended release naltrexone
 - Longitudinal follow-up and management
 - Co-occurring (dual diagnosis) treatment
 - Flexible movement up and down levels of care

Residential Admission: Detox

- 7d standardized detox protocol
 - Suboxone, max 12mg daily
 - First dose when symptomatic/in withdrawal
- During 7 d detox lay groundwork for next step of treatment
 - Detox/residential stay is NOT a CURE
 - First battle in a long war
 - Engage/transition into outpatient treatment

Detox Issues

- Asleep or awake?
- Aggressive symptom management
 - Diarrhea/constipation, aches & chills, anxiety, insomnia
- Where will they live after residential
- Verifying insurance coverage
 - Impacts both inpt/resid care & planning for aftercare

Buprenorphine induction method

- Residential detox using bupe taper
- Interruption of taper, switch to steady dose, or
- Completion of taper, later resume bupe
- Alternative induction as outpatient (minority)
- Outpatient maintenance

Ryan

- 19 M injection heroin, multiple treatments
- Does well during IOP, with structure of recovery house
- Typical pattern of relapse after high intensity treatment, after leaving structured environment
- Buprenorphine treatment for the first time gives him a link to continuing care and a bridge out of recovery house
- Abstinent 15 months, back home with parents, back at college

XR-NTX Induction

- Residential detox using bupe taper
- 7 day opioid washout by confinement
- NTX induction with 4 d oral dose titration
 - 6.25, 12.5, 25, 50 mg
- 1st dose injectable XR-NTX prior to residential discharge
- Outpatient maintenance

Brittany

- 15 yo WF
- 1 yr hx prescription opioids, recent progression to injection heroin, parents didn't know extent of dependence, shocked to discover a needle
- Parents compelled by idea of XR-NTX

Choice of medication: Bupe vs XR-NTX

- Patient preference
- Family preference
- Failure of other treatments, try something new
- Side effects, anxious anticipation
- Long acting duration of xr-ntx for poor treatment engagement and adherence
- Bupe intrinsically reinforcing
- More familiarity with bupe, pos and neg reputation
- Problems with acceptability of agonist pharmacotherapies
- More tools in the toolbox

Jennifer

- 17 yo from the suburbs, injection heroin x 2 years, 3rd episode detox
- Uses street bupe intermittently
- Strong parental and juvenile justice pressures, ambivalent about quitting
- “If I wake up & there is heroin & suboxone on the table -- I’ll use heroin every time”
- Agrees to trial of XR-NTX

What’s the active ingredient?

- Question:
Which is better –
medications or counseling or meetings?
- Answer:
Yes

Encouraging MAR/MAT

- Battling myths and untruths
 - I will still have cravings
 - I will be “addicted to something else”
 - I hate needles
 - Suboxone makes you sick, I need subutex
 - NTX makes you sick
 - NTX puts you in withdrawal
 - You can die on NTX/XR-NTX

Continuing care

- Start daily administration for bupe, increase duration of Rx duration over time, used as contingency management
- Monthly injections for xr-ntx
- Expectation of counseling attendance
- Opioid-specific group
- Frequent urine monitoring

Features of youth treatment

- Family leverage
- Pushback against sense of parental dependence and restriction
- Saliency of burdens of treatment
- Prominence of co-morbidity
- Family mobilization – “Medicine may help with the receptors, you still have to parent your difficult teenager”

Chloe

- 18 F onset injection heroin 16, occasional street suboxone
- Outpatient suboxone maintenance but would take it only intermittently when heroin unavailable
- Clarified goal: not ready to quit, suboxone stopped but MET continued
- 2 months later Rx restarted under mother's supervision with new commitment --> 6 months abstinence

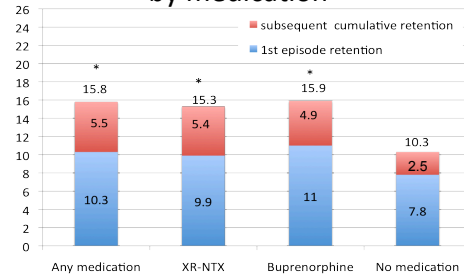
Matthew

- 19 M, 3 yr hx injection heroin
- 4 previous episodes detox, 2 previous episodes of failure with bupe outpt treatment
- Wants to try bupe again
- Parents make XR-NTX a condition of returning home

Greg

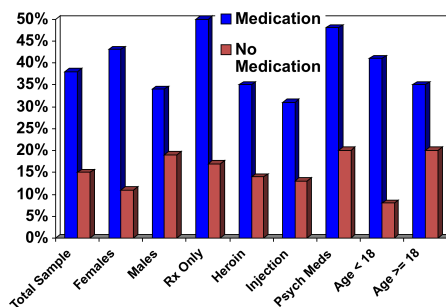
- 16 M prescription opioid dependence
- Residential detox, XR-NTX induction
- Abstinent x 3 months
- Family vacation, out of town, dose #4 delayed
- While at beach started deliberate plan to use, diverting few dollars at a time to prevent detection
- On return, told parents he was headed to treatment, went to get drugs instead, missed XR-NTX
- Relapse x 3 weeks
- Brief residential detox
- Restart XR-NTX with new level of parental involvement

Cumulative retention over 26 weeks by medication

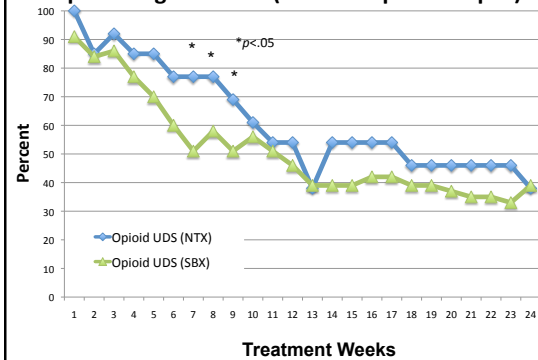


* = p < 0.01 compared to no medication

Additional Factors Medication vs. No Medication Cross-sectional retention at 26 weeks



Young adults Opioid Negative UDS (absent imputed as pos)



Challenges:
Medications, mischief, and monkey business

- Attitudes, misunderstanding and stigma
- Adherence and inconsistency
- Side effects
- Diversion
- Other substances

Prepare for discrepancy and stigma

- How to talk to family
- How to talk to others in the 12 step fellowship
- How to shop for meetings and sponsors
- Don't ask, don't tell?

Sarah

- 18 F injection heroin, multiple failed treatments
- Inpatient treatment, recovery house, continuation suboxone
- Made connection to NA for the first time
- Abstinent x 6 months
- Told at NA meeting "not really clean" → stopped Rx
- Relapse
- 6 months later back on suboxone
- New stance towards Rx "don't ask, don't tell"
- 2 years abstinence

Additional adherence enhancements

- Long acting formulations
- Increased intensity / frequency of provider monitoring
- Increased coordination and communication between medical and counseling staff
- Role of concerned other in monitoring of adherence (eg network therapy)
- Supervised administration by caregiver or staff
- Prescriptions left for counselor to distribute
- Direct med administration up to daily

Future directions

- Increased family involvement and responsibility
- Assertive outreach
- Home delivery of XR-NTX
- Longer term residential support

A sprint or a marathon?

Early: I agree I was out of control with the dope, but I can still use a little oxy on the weekends.

Middle: I'm a heroin addict, not an alcoholic. I just need to stop using opioids. A few beers is fine.

Later: When I drink I get drunk, and I end up using heroin again. Maybe I need to stop drinking too. But taking a little xanax when I'm stressed is no big deal. And you don't understand – marijuana is my medicine.

(sigh)

What is the main ingredient?

Question:

Is it medication-assisted treatment, or counseling-assisted medication

Answer:

Yes

Case - Brandon

- 17 M injection heroin.
- Onset prescription opioids age 15, progressing to daily use with withdrawal within 8 months, onset nasal heroin age 16, onset injection heroin 6 months later, 3 previous episodes residential treatment, 2 left early AMA, previous episode buprenorphine treatment (monthly supply Rx x 4, took erratically, sold half)
- Ongoing psychiatric treatment for depression and anxiety, erratic course, prescribed xanax, 2-4 mg/d with supplemental street use. Psychiatrist does not know about illicit drug use. He has opposed his parents exchange of info with psychiatrist
- Now admitted to inpatient detox/rehab.

Treatment Issues: Brandon

- The “Experienced” patient
 - Customized detox protocol
 - Higher doses of suboxone
 - Benzodiazepines
 - Longer or shorter detox
 - Appreciate their experience
 - Previous treatments
 - Previous MAR
 - Circumstances of relapse

What are you going to do differently this time?

Case - Brandon (2)

- Discussions about longer term residential, recovery house, IOP, dismissive about all. Parents reluctant to allow him to come home, he insists no problem, he is certain that this time he “really means it”
 - Decision point – “I don’t want you to talk to my psychiatrist”
 - Decision point – medications?
 - Decision point – what will you recommend to the parents about returning home?
 - Decision point – doesn’t want to discontinue benzodiazepines: “nothing else works... you don’t understand...”
 - Alternative scenario – if he were 19?

Case - Brandon (3)

- Rx bupe, reluctantly agrees to recovery house
- Begins OP while at recovery house, erratic about attendance at group, UDS persistently pos for opioids (and other substances), describes that cravings increased after discharge, feels a little “ill” towards the end of the day, uses on top of the bupe
 - Decision point – how will you modify the treatment plan?
 - Alternative scenario – if he were living at home?
 - Alternative scenario – if he were on XR-NTX

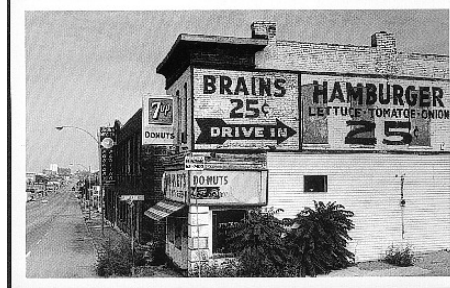
Case - Brandon (4)

- UDS persistently pos for opioids (and other substances), says that he uses when he postpones or “forgets” the bupe
 - Decision point – how will you modify the treatment plan?

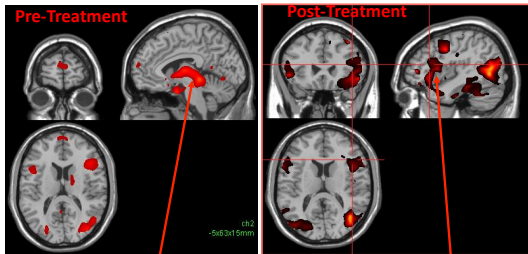
Case - Brandon (5)

- UDS neg for opioids but persistently pos for BZD, says “stressed out” “anxiety killing me” still having trouble sleeping
- Decision point – how will you modify the treatment plan?

Hypothetical Miracle Cures



Changes in Brain Activation Patterns Before and After Treatment in Adolescents Addicted to Marijuana



Before treatment, adolescents showed greater **brain reward** activation to marijuana cues vs food

After 16 weeks of CBT adolescents showed greater activation to marijuana vs food in areas of **cognitive control** than before treatment

Riggs et al., *Drug and Alcohol Dependence*, 91, 2007

Youth SUD and co-occurring disorders At a crossroads

- A national crisis
- A proven set of both old and new tools, good but not yet good enough
- Alarmingly poor level of dissemination and adoption, lack of coherent deployment
- We have an obligation to do better

We've come a long way...



But we have a long way to go.