Evidence Based Treatment and Guidelines for Adolescents with Substance Use Disorders

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Disclosures and Acknowledgements

• As noted in the introduction, I am the developer of the GAIN, director of the GAIN Coordinating Center and will be using GAIN data from several colleagues as part of this presentation.

• I currently receive funding from NIDA, NIAAA, and CSAT to support my research and GCC work and will use data from this as part of the presentation as well.

• I want to thanks the programs using the GAIN, authors of other studies cited for sharing their data and slides, SAMHSA for providing access to data through public data sets and Darren Urada for checking trends in CalOMS-Tx .

• Any opinions about this data are mine and do not reflect official positions of the government, programs or other authors.
Objectives

1. Examine the trends in youth presenting to substance use disorders (SUD) treatment in California and how they compare to the rest of the U.S.

2. Summarize the National Institute on Drug Abuse’s current recommendations for providing evidence based treatment to adolescents with SUD

3. Illustrate the data behind these recommendations from multiple meta analyses, large studies, and replications across multiple settings (community, school, justice); and

4. Identify emerging issues related to value based contracting and how it is related to multi-morbidity, level of care, trauma informed care, costs of health care and crime, and technology assisted care
1. California Trends and Comparison to the U.S.

- Using the latest data from the National Survey on Drug Use and Health (NSDUH) and Treatment Episode Data System (TEDS) we can look at trends in CA and compare CA to the U.S.
- Of the 24.8 million adolescents aged 12-17 in the U.S., 5% live in California.
- Of the 1.2 million youth getting any kind of behavioral health intervention, 6% live in California.
SUD Tx Health Disparities in California by Age

SUD on-sets in adolescences and peaks in young adulthood

Unmet Need even higher for adolescents (and young adults)

<table>
<thead>
<tr>
<th>% Past Year</th>
<th>Age 12-17</th>
<th>Age 18-25</th>
<th>Age 26+</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any SUD</td>
<td>5.4%</td>
<td>17.1%</td>
<td>7.0%</td>
</tr>
<tr>
<td>Any Treatment</td>
<td>0.2%</td>
<td>0.8%</td>
<td>0.5%</td>
</tr>
<tr>
<td>% Unmet Need</td>
<td>96.6%</td>
<td>95.1%</td>
<td>93.1%</td>
</tr>
</tbody>
</table>


Very high rates of unmet need
SUD Health Disparities in U.S. vs. CA for Adolescents

Relative to adolescents in the US, adolescents in CA have slightly higher rates of SUD, less treatment and higher unmet need.

<table>
<thead>
<tr>
<th></th>
<th>US</th>
<th>CA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any SUD</td>
<td>5.1%</td>
<td>5.4%</td>
</tr>
<tr>
<td>Any Treatment</td>
<td>0.3%</td>
<td>0.2%</td>
</tr>
<tr>
<td>% Unmet Need</td>
<td>94.4%</td>
<td>96.6%</td>
</tr>
</tbody>
</table>

### Lack of Parity by Problems Area: U.S. Youth In School

**The unmet need for treatment is much worse for SUD than for mental or physical health**

<table>
<thead>
<tr>
<th></th>
<th>% Past Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Major Physical Health Condition</td>
<td>15.3%</td>
</tr>
<tr>
<td>Mood/Anxiety Disorder</td>
<td>31.5%</td>
</tr>
<tr>
<td>Substance Use Disorder</td>
<td>0.0%</td>
</tr>
</tbody>
</table>

**Source:** Denis, M. L., Clark, H. W., & Huang, L. N. (2014). The need and opportunity to expand substance use disorder treatment in school-based settings. Advances in school mental health promotion, 7(2), 75-87.
Trends in California Adolescent SUD Treatment Admissions by Year

We’ve seen a similar trend in adolescent admissions across the U.S.

Has continued to decline since

Source: SAMHSA (2016) Treatment Episode Data Set: Admissions (TEDS-A) data sets for 2010-2014. subset to Adolescents (12-17) from California.
Trends in CA Adolescent Admissions: Substance(s)

- Marijuana (+7%)
- Alcohol (-14%)
- Stimulants (-20%)
- Opioids (+20%)
- Other Drugs (-7%)

<table>
<thead>
<tr>
<th></th>
<th>Marijuana</th>
<th>Alcohol</th>
<th>Stimulants</th>
<th>Opioids</th>
<th>Other Drugs</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>82%</td>
<td>50%</td>
<td>14%</td>
<td>2%</td>
<td>3%</td>
</tr>
<tr>
<td>2011</td>
<td>83%</td>
<td>48%</td>
<td>9%</td>
<td>2%</td>
<td>3%</td>
</tr>
<tr>
<td>2012</td>
<td>86%</td>
<td>47%</td>
<td>9%</td>
<td>2%</td>
<td>3%</td>
</tr>
<tr>
<td>2013</td>
<td>86%</td>
<td>44%</td>
<td>10%</td>
<td>2%</td>
<td>2%</td>
</tr>
<tr>
<td>2014</td>
<td>88%</td>
<td>43%</td>
<td>11%</td>
<td>3%</td>
<td>3%</td>
</tr>
</tbody>
</table>

Source: SAMHSA (2016) Treatment Episode Data Set: Admissions (TEDS-A) data sets for 2010-2014. subset to Adolescents (12-17) from California.
U.S. vs. CA Adolescent Admissions: Substance(s)

<table>
<thead>
<tr>
<th>Substance(s)</th>
<th>U.S. 2014 (77,812)</th>
<th>CA 2014 (14,105)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Marijuana</td>
<td>89%</td>
<td>88%</td>
</tr>
<tr>
<td>Alcohol</td>
<td>44%</td>
<td>43%</td>
</tr>
<tr>
<td>Stimulants</td>
<td>12%</td>
<td>11%</td>
</tr>
<tr>
<td>Opioids</td>
<td>8%</td>
<td>3%</td>
</tr>
<tr>
<td>Other Drugs</td>
<td>13%</td>
<td>3%</td>
</tr>
</tbody>
</table>

Relative to the average across the U.S., CA has less adolescent admissions for opioids and other drugs.

Source: SAMHSA (2016) Treatment Episode Data Set: Admissions (TEDS-A) data sets for 2014. subset to Adolescents (12-17).
Trends in CA Adolescent Admissions: Level of Care

**CA SUD Treatment system has and continues to be predominately outpatient**

The % of Residential admissions grew – but this was actually because they shrunk slower than outpatient admissions did in this period.

<table>
<thead>
<tr>
<th>Year</th>
<th>Outpatient (+2%)</th>
<th>Intensive Outpatient (-14%)</th>
<th>Residential (+30%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>84%</td>
<td>11%</td>
<td>5%</td>
</tr>
<tr>
<td>2011</td>
<td>84%</td>
<td>12%</td>
<td>4%</td>
</tr>
<tr>
<td>2012</td>
<td>82%</td>
<td>14%</td>
<td>4%</td>
</tr>
<tr>
<td>2013</td>
<td>79%</td>
<td>16%</td>
<td>5%</td>
</tr>
<tr>
<td>2014</td>
<td>86%</td>
<td>8%</td>
<td>7%</td>
</tr>
</tbody>
</table>

Source: SAMHSA (2016) Treatment Episode Data Set: Admissions (TEDS-A) data sets for 2010-2014. subset to Adolescents (12-17) from California.
U.S. vs. CA Adolescent Admissions: Level of Care

Relative to the U.S. averages, CA adolescent SUD treatment systems has more outpatient admissions and less intensive outpatient and residential treatment admissions.

<table>
<thead>
<tr>
<th></th>
<th>US 2014 (77,812)</th>
<th>CA 2014 (14,015)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outpatient (+25%)</td>
<td>69%</td>
<td>86%</td>
</tr>
<tr>
<td>Intensive Outpatient (-41%)</td>
<td>13%</td>
<td>8%</td>
</tr>
<tr>
<td>Residential (-58%)</td>
<td>16%</td>
<td>7%</td>
</tr>
</tbody>
</table>

Source: SAMHSA (2016) Treatment Episode Data Set: Admissions (TEDS-A) data sets for 2014. subset to Adolescents (12-17).
Trends in CA Adolescent Discharges: Length of Stay

CA has trends for more short and long lengths of stay, with fewer in the middle.

<table>
<thead>
<tr>
<th>Year</th>
<th>1-29 days (+14%)</th>
<th>31-90 days (-15%)</th>
<th>91+ days (+4%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>16%</td>
<td>30%</td>
<td>55%</td>
</tr>
<tr>
<td>2010</td>
<td>18%</td>
<td>28%</td>
<td>55%</td>
</tr>
<tr>
<td>2011</td>
<td>18%</td>
<td>26%</td>
<td>56%</td>
</tr>
<tr>
<td>2012</td>
<td>17%</td>
<td>26%</td>
<td>57%</td>
</tr>
<tr>
<td>2013</td>
<td>18%</td>
<td>25%</td>
<td>57%</td>
</tr>
</tbody>
</table>

Source: SAMHSA (2016) Treatment Episode Data Set: Discharges (TEDS-D) data sets for 2009-2013. subset to Adolescents (12-17) from California.
U.S. vs. CA Adolescent Discharges: Length of Stay

**Graph:**
- **Legend:**
  - US 2013 (19,511)
  - CA 2013 (94,401)

### Length of Stay
- **1-29 days (+21%)**
  - US: 17.8%
  - CA: 21.6%
- **31-90 days (+28%)**
  - US: 25.2%
  - CA: 32.2%
- **91+ days (-19%)**
  - US: 57.0%
  - CA: 46.3%

**Source:** SAMHSA (2016) Treatment Episode Data Set: Discharges (TEDS-D) data sets for 2013. subset to Adolescents (12-17).
## Trends in CA Adolescent Discharges: Status

Rates of treatment completion and/or transfers to continuing care are over 50% combined and have been improving.

<table>
<thead>
<tr>
<th></th>
<th>Completed (+14%)</th>
<th>Transferred (+9%)</th>
<th>Against Professional Advice (-13%)</th>
<th>Incarcerated (+9%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2009</strong></td>
<td>28%</td>
<td>21%</td>
<td>47%</td>
<td>3%</td>
</tr>
<tr>
<td><strong>2010</strong></td>
<td>29%</td>
<td>23%</td>
<td>45%</td>
<td>3%</td>
</tr>
<tr>
<td><strong>2011</strong></td>
<td>29%</td>
<td>23%</td>
<td>45%</td>
<td>4%</td>
</tr>
<tr>
<td><strong>2012</strong></td>
<td>32%</td>
<td>25%</td>
<td>40%</td>
<td>4%</td>
</tr>
<tr>
<td><strong>2013</strong></td>
<td>32%</td>
<td>23%</td>
<td>41%</td>
<td>4%</td>
</tr>
</tbody>
</table>

During this 5 year period, the death rate in treatment dropped significantly (10.00 vs. 2.05 per 10,000 adolescent admissions).

Source: SAMHSA (2016) Treatment Episode Data Set: Discharges (TEDS-D) data sets for 2009-2013. subset to Adolescents (12-17) from California.
U.S. vs. CA Adolescent Discharges: Status

CA has Lower rates of completion, higher rates of transfer, and similar rates when combined.

Even if we add “terminated by facility” (which CA does not use), CA is still much higher than the US.

CA also higher on discharge to incarceration.

Relative to the U.S. average, CA also has lower death rate in treatment (4.66 vs. 2.05 per 10,000 adolescent admissions in 2013)

Source: SAMHSA (2016) Treatment Episode Data Set: Discharges (TEDS-D) data sets for 2013. subset to Adolescents (12-17).
California is geographically very diverse in terms of the density of people per square mile.

It has counties both above and below the national average of 88.4 People per square miles.

While rates of adolescent SUD do not vary much by county – which drugs they use do.

The types of treatment system and availability, vary even more with higher levels of care often being far away or unavailable.
CA counties are in the middle to high end of all U.S. Counties
• Adolescents (and young adults) have high rates of SUD and more unmet need for treatment than adults or adolescents with mental health or health problems
• The size of the adolescent treatment system in California and the U.S. have actually been getting smaller
• While CA adolescent admissions for opioids are less than the U.S. average, they are growing at a percent of admissions
• While California has fewer residential adolescent admissions than the, they have been shrinking less than outpatient admissions.
• California has lower than average lengths of stay and higher negative discharge - but fewer deaths
• California counties are very diverse in population density, but well within U.S. averages
• Thus much of the research to date is likely to be germane for adolescent treatment in California
2. NIDA’s Recommendations

NIDA Recommendations

1. Adolescent substance use needs to be identified and addressed as soon as possible
2. Adolescents can benefit from a drug abuse intervention even if they are not addicted to a drug
3. Routine annual medical visits are an opportunity to ask adolescents about drug use
4. Legal interventions and sanctions or family pressure may play an important role in getting adolescents to enter, stay in, and complete treatment
5. Substance use disorder treatment should be tailored to the unique needs of the adolescent
6. Treatment should address the needs of the whole person, rather than just focusing on his or her drug use
7. Behavioral therapies are effective in addressing adolescent drug use
NIDA Recommendations (continued)

8. Families and the community are important aspects of treatment
9. Effectively treating substance use disorders in adolescents requires also identifying and treating any other mental health conditions they may have
10. Sensitive issues such as violence and child abuse or risk of suicide should be identified and addressed
11. It is important to monitor drug use during treatment
12. Staying in treatment for an adequate period of time and continuity of care afterward are important
13. Testing adolescents for sexually transmitted diseases like HIV, as well as hepatitis B and C, is an important part of drug treatment

Across these substantive areas, NIDA recommends using standardized screeners/clinical assessments and evidence based treatment/practices wherever possible
• NIDA’s recommendations were built upon prior consensus panels by drug strategies, meta analysis funded by NIAAA, research reviews and practice based data from SAMHSA.
• They are consistent with subsequent recommendations put out by OJJDP (2016) for juvenile drug treatment courts (JDTC) – though the later also includes more recommendations on measuring recidivism, targeting high risk youth, the JDTC team and monitoring.
• These recommendations are also consistent with data, thus make a good starting place for designing a new system for California.
3. Data Behind the Recommendations

Illustrate the data behind these recommendations from national/large studies, multiple meta analyses, and replications across multiple settings (community, school, justice)
Substance use generally begins during adolescence

Over 90% of use and problems start between the ages of 12-20

It takes decades before most recover or die

People with drug use disorders die an average of 22.5 years sooner than those without a diagnosis

Severity Category
- Other drug or heavy alcohol use in the past year
- Substance Use Disorders (SUD) in the past year

Substance use careers last for decades

Cumulative Survival

Median of 27 years from first use to 1+ years abstinence

Careers are **longer** the younger the age of first use

![Cumulative Survival Graph](image-url)

- **60% longer**

Careers are **shorter** the sooner treatment is accessed

![Graph showing cumulative survival over years from first use to 1+ years abstinence.](image)

- **Years from first use to 1+ years abstinence**
- **Cumulative Survival**
- **Year to 1\textsuperscript{st} Tx**
  - 20+
  - 10-19*
  - 0-9*

57% shorter

* p<.05 (different from 20+)

Severity in the community based on just 5 SUD symptoms: Adolescents (ages 12 to 17)

Number of Past Year Symptoms

<- 6% High (3 to 5 Symptoms)

<- 9% Moderate (1 to 2 Symptoms)

<- 86% Low (0 Symptoms)

Source: 2012 NSDUH analysis in Dennis, ML, Estrada, B, & Funk, R (2017). Using the Global Appraisal of Individual Needs Short Screener (GAIN-SS) Substance Disorder Screener (SDScr) in Screening Brief Intervention and Referral to Treatment (SBIRT) in General and for Adolescents, Young Adults, Adults and Older Adults Normal, IL: Chestnut Health Systems. Available from https://chestnut.box.com/v/workingpapers
Using Severity to Predict Other Problems/Costs: Adolescents by SUD Severity

<table>
<thead>
<tr>
<th>Condition</th>
<th>Low</th>
<th>Moderate</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any Physical Health Problem</td>
<td>15%</td>
<td>10%</td>
<td>20%</td>
</tr>
<tr>
<td>(OR=1.5)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Any Mental Health Problem</td>
<td>10%</td>
<td>20%</td>
<td>35%</td>
</tr>
<tr>
<td>(OR=4.9)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Any Missed Work</td>
<td>2%</td>
<td>7%</td>
<td>7%</td>
</tr>
<tr>
<td>(OR=2.9)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Any School Problems</td>
<td>57%</td>
<td>77%</td>
<td>85%</td>
</tr>
<tr>
<td>(OR=4.3)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Any Justice System Involvement</td>
<td>3%</td>
<td>8%</td>
<td>24%</td>
</tr>
<tr>
<td>(OR=12.3)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Any Violent Behavior</td>
<td>16%</td>
<td>29%</td>
<td>41%</td>
</tr>
<tr>
<td>(OR=3.8)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Multiple (3 to 6) Other Problems</td>
<td>7%</td>
<td>20%</td>
<td>35%</td>
</tr>
<tr>
<td>(OR=7.1)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High Health Care Costs</td>
<td>15%</td>
<td>22%</td>
<td>29%</td>
</tr>
<tr>
<td>(OR=2.3)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

High group more likely than low group (15% vs. 22%, OR=2.3) to have more than $7,600 of health care costs in 2012.

Source: 2012 NSDUH analysis in Dennis, ML, Estrada, B, & Funk, R (2017). Using the Global Appraisal of Individual Needs Short Screener (GAIN-SS) Substance Disorder Screener (SDScr) in Screening Brief Intervention and Referral to Treatment (SBIRT) in General and for Adolescents, Young Adults, Adults and Older Adults Normal, IL: Chestnut Health Systems. Available from https://chestnut.box.com/v/workingpapers
Using the GAIN Short Screener in Washington State

Problems could be easily identified with 5-minute screener & comorbidity was common

<table>
<thead>
<tr>
<th>Service</th>
<th>Either</th>
<th>High on Mental Health</th>
<th>High on Substance</th>
<th>High on Both</th>
</tr>
</thead>
<tbody>
<tr>
<td>Substance Abuse Treatment</td>
<td>77%</td>
<td>67%</td>
<td>47%</td>
<td>20%</td>
</tr>
<tr>
<td>(n=8,213)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Student Assistance Programs</td>
<td>86%</td>
<td>83%</td>
<td>47%</td>
<td>4%</td>
</tr>
<tr>
<td>(n=8,777)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Juvenile Justice</td>
<td>73%</td>
<td>62%</td>
<td>46%</td>
<td>12%</td>
</tr>
<tr>
<td>(n=2,024)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mental Health Treatment</td>
<td>75%</td>
<td>75%</td>
<td>46%</td>
<td>12%</td>
</tr>
<tr>
<td>(n=10,937)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Children's Administration</td>
<td>41%</td>
<td>60%</td>
<td>12%</td>
<td>11%</td>
</tr>
<tr>
<td>(n=239)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Comparison of With All Information in Clinical Record

The 2-page measure closely approximated findings from all data found in the clinical record during the next two years.

- Substance Abuse Treatment (n=8,213): GAIN Short Screener 47%, All Available Clinical Indicators 56%
- Juvenile Justice (n=2,024): GAIN Short Screener 35%, All Available Clinical Indicators 34%
- Mental Health Treatment (n=10,937): GAIN Short Screener 12%, All Available Clinical Indicators 15%
- Children's Administration (n=239): GAIN Short Screener 11%, All Available Clinical Indicators 9%

Relative Size & Importance of School Based System

SAP+ SA Treatment over half of behavior health system

While fewer admissions to Justice and Children’s administration programs, they were more expensive kids

School Assistance Programs (SAP) largest part of BH/MH system; 2nd largest of SA & Co-occurring systems

Potential for Screening Sites Based on Past Year Contact

Schools (and to a lesser extent emergency rooms) are the best location to find adolescents with SUD.

In CA, Schools are the leading source of referral to SUD treatment (30%).

Source: Dennis, M. L., Clark, H. W., & Huang, L. N. (2014). The need and opportunity to expand substance use disorder treatment in school-based settings. Advances in school mental health promotion, 7(2), 75-87.
Behavioral Health Service Cascade in Juvenile Justice

Youth in JJ have much higher rates of need and initiating treatment

JJ is the leading sources of Tx referral in the US (44%) and second most common source in CA (27%)

Once these JJ youth enter treatment, their rates of engagement (6 weeks) and continuing care (90+ days) are similar

<table>
<thead>
<tr>
<th>Need (% All)</th>
<th>Initiation (% Need)</th>
<th>Engagement (% Initiated)</th>
<th>Continuing Care (% Initiated)</th>
</tr>
</thead>
<tbody>
<tr>
<td>NSDUH 2014 data</td>
<td>TEDS-D 2013 data</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adolescents NOT Involved in JJS in the past year</td>
<td>Adolescents with any involvement in JJS in the past year</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

9% 37% 68% 47% 4% 19% 69% 44% 0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

Of those in need, only 41% get referred and only 24% initiated treatment

<table>
<thead>
<tr>
<th></th>
<th>Screened or assessed</th>
<th>Need for SU Tx</th>
<th>JJ Referrals to SU Tx</th>
<th>Initiated SU Tx</th>
<th>Engaged in SU Tx</th>
<th>Continuing Care</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TOTAL</strong></td>
<td>17,974</td>
<td>17,974</td>
<td>9,198</td>
<td>9,198</td>
<td>2,223</td>
<td>2,223</td>
</tr>
<tr>
<td><strong>Yes</strong></td>
<td>12,671</td>
<td>9,198</td>
<td>3,795</td>
<td>2,223</td>
<td>1,368</td>
<td>874</td>
</tr>
<tr>
<td><strong>% Total</strong></td>
<td>70%</td>
<td>51%</td>
<td>21%</td>
<td>12%</td>
<td>8%</td>
<td>5%</td>
</tr>
<tr>
<td><strong>% Step</strong></td>
<td>70%</td>
<td>51%</td>
<td>41%</td>
<td>24%</td>
<td>62%</td>
<td>39%</td>
</tr>
</tbody>
</table>

Key Points

• SUDs are primarily an adolescent on-set chronic disorder that can last for decades, but have a high rate of long term remission
• Early intervention significantly reduces the time to remission
• Identification of SUDs (and other mental health disorders) can be done even with very short screeners
• SUDs are related to a wide range of co-occurring problems and high health care costs
• Schools settings represent a key place to screen for SUD and provide treatment
• Juvenile justice sees youth at particularly high risk of SUD and are one of the most common sources of referral, but face additional barriers to accessing care
# Current Renaissance of Adolescent SUD Treatment Research

<table>
<thead>
<tr>
<th>Feature</th>
<th>1930-1997</th>
<th>1997-2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Published Studies</td>
<td>16</td>
<td>Over 200</td>
</tr>
<tr>
<td>Treatment Manuals</td>
<td>0</td>
<td>30+</td>
</tr>
<tr>
<td>QA/Adherence</td>
<td>Rare</td>
<td>Common</td>
</tr>
<tr>
<td>Std Assessment</td>
<td>Rare</td>
<td>Common</td>
</tr>
<tr>
<td>Participation Rates</td>
<td>Under 50%</td>
<td>Over 80%</td>
</tr>
<tr>
<td>Follow-up Rates</td>
<td>40-50%</td>
<td>80-95%</td>
</tr>
<tr>
<td>Random/Quasi Reviews</td>
<td>9</td>
<td>Over 50</td>
</tr>
<tr>
<td>Reviews</td>
<td>Descriptive</td>
<td>5 meta analysis</td>
</tr>
<tr>
<td>Economic</td>
<td>Some Cost</td>
<td>Cost, CEA, BCA</td>
</tr>
</tbody>
</table>
Result of Recent Meta Analysis

• Treatment in adult programs and boot camps associated with negative effects
• Contrary to earlier speculation, there is no negative effect of group based treatment
• Treatment “as usual” is no better than prevention education only or no treatment
• However a wide range of more recent evidence-based treatments (EBTs) do significantly better – with family based EBTs doing a little better still
• Effective EBT are characterized by being developmentally appropriate, using motivation, cognitive and behavioral modification theory, and in the best cases involving families
• Similarity of outcomes among EBT make looking at cost important

Problems with Adolescent SUD Treatment “as usual”

- Among the adolescents who make it to treatment as usual, less than half
  - are discharged successfully
  - stay in treatment for 90 or more days
  - are transferred to continuing care
  - access recovery support services
  - make it 90 days after discharge without relapse

- Less than 1/3rd of those with co-occurring disorders receive mental health treatment in the first 90 days

- Publicly funded programs met only 6 of 14 quality indicators 80% or more of the time

Sources: Brannigan et al, 2004; Chan et al 2009; Dennis, Clark & Huang, 2014; Hunter et al 2013; NIDA, 2014; SAMHSA, 2013b
Similarity of Clinical Outcomes: Cannabis Youth Treatment (CYT)

Not significantly different by condition

But better than the average for OP in ATM (200 days of abstinence)

Moderate to Large Differences in Cost-Effectiveness by Condition

Integrated family therapy (MDFT) more cost effective than adding family treatment to other treatment

Source: Dennis et al., 2004
Change in Measure of Academic Performance (MAP) by Change in Substance Disorder Screener Past Month: Recovery High School

Moreover, relative to a matched comparison of Indiana Students, those in recovery schools did significantly better in terms of

- Language Usage and \( (t^{(56)} = 1.87, p < .05) \)
- Mathematics \( (t^{(56)} = 2.35, p < .05) \)

Source: Rattermann, M.J. (2014)
More Intensive Continuing Care After Residential Treatment Produced Greater Savings*

EBP’s like Contingency Management and Assertive Continuing Care are more cost-effective.

Usual Continuing Care (UCC) $4,816
Contingency Management (CM) $10,910
Assertive Continuing Care (ACC) $11,559
CM + ACC $7,876

* Defined as 12 month post discharge costs to society minus 12 month pre intake costs to society.

Source: Godley et al 2014

But there are still points of diminishing returns.
Complexity of Adolescent Pathways to Recovery

Change occurs in every possible direction

In the Community Using (60% stable)

Incarcerated (41% stable)

In Treatment (45% stable)

In Recovery (61% stable)

What predicts who enters and maintains recovery?

Avg of 48% change status each quarter

Treatment is the most likely path to recovery

Source: 2009 CSAT AT data set; unique n = 11,710
Protective and Risk Factors Associated with Transitioning to/Remaining in Recovery

• **Protective Factors**
  - Younger
  - Female
  - Racial Minority
  - Recent Treatment
  - Number of Drug Screens
  - Attend 12 Step Meetings
  - Positive Social Peers
  - Positive Recovery Environment
  - School Attendance/Conduct

While recent treatment is good, multiple episodes of treatment suggest a bad prognosis.

• **Risk Factors**
  - Older
  - Male
  - Caucasian
  - Substance Problems
  - Substance Frequency
  - Repeated Treatment
  - Mental Health Problems
  - Illegal Activity
  - Employment

While school improves the odds of going into and staying in recovery, employment makes them less likely to do so.

Source: 2009 CSAT Adolescent Treatment Dataset
Key Points

• A wide range of evidence based treatment and recovery support practices have consistently demonstrated that they do better on average than
  ▪ treatment as usual,
  ▪ education only, or
  ▪ no treatment

• It is important to also look at the cost effectiveness of treatment as well

• The long term pathways to recovery are complicated, but can be predictable.
So What are the General Predictors of Bigger Treatment Effects?

1. Assessment and triage to focus on the highest severity subgroup
2. A strong intervention protocol based on prior evidence
3. Quality assurance and performance monitoring to ensure protocol adherence and project implementation
4. Proactive case supervision of individual
Impact of the Numbers of These Favorable Features on Recidivism in 509 Juvenile Justice Studies in Lipsey Meta Analysis

<table>
<thead>
<tr>
<th>Number of favorable features</th>
<th>Distribution of programs</th>
<th>Percentage reduction in recidivism</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>7%</td>
<td>+12</td>
</tr>
<tr>
<td>1</td>
<td>50%</td>
<td>-2</td>
</tr>
<tr>
<td>2</td>
<td>27%</td>
<td>-10</td>
</tr>
<tr>
<td>3</td>
<td>15%</td>
<td>-20</td>
</tr>
<tr>
<td>4</td>
<td>2%</td>
<td>-24</td>
</tr>
</tbody>
</table>

Source: Adapted from Lipsey, 1997, 2009

The more features, the lower the recidivism.
Wide Range of Replicable Approaches that Averaged 60-70% Better Effects than Standard Practice, Prevention Education, or Nothing

- Adolescent Community Reinforcement Approach (ACRA)
- Assertive Continuing Care (ACC)
- Cognitive behavioral therapy (CBT)
- Contingency Management (CM)
- Family Support Network (FSN)
- Functional Family Therapy (FFT)
- Motivational interviewing/enhancement therapy (MET)
- Motivational interviewing (MI)
- Motivational interviewing/enhancement therapy (MET)
- Multidimensional Family Therapy (MDFT)
- Multi-Systemic Therapy (MST)
- Combinations of above

**Implementation is Essential**
(Reduction in Recidivism from .50 Control Group Rate)

<table>
<thead>
<tr>
<th>Program Type Grouped by Rank</th>
<th>Program Implementation: Amount of Service, Quality of Delivery</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low</td>
</tr>
<tr>
<td>Group 1 (best)</td>
<td>24%</td>
</tr>
<tr>
<td>Group 2</td>
<td>16%</td>
</tr>
<tr>
<td>Group 3</td>
<td>6%</td>
</tr>
<tr>
<td>Group 4 (poorest)</td>
<td>0%</td>
</tr>
</tbody>
</table>

Thus one should optimally pick the strongest intervention that one can implement well.

The best is to have a strong program implemented well.

The effect of a well implemented weak program is as big as a strong program implemented poorly.

Source: Adapted from Lipsey, 1997, 2009
Impact of Quality Assurance on Change in Abstinence: Adolescent Community Reinforcement Approach (A-CRA)

Effects associated with Coaching, Certification and Monitoring (OR=7.6)

Source: CSAT 2008 SA Dataset subset to 6 Month Follow up (n=1,961)
Other Factors that Have Been Shown to Produce Better Adolescent Treatment Outcomes

- Motivational Interviewing/Brief Interventions (Carney & Meyers, 2012; Tanner-Smith et al 2015)
- Prize-based contingency management (Benishek et al 2014)
- Behavioral therapies (Davies et al 2014)
- Family therapy (Baldwin et al 2012; Filges et al 2015; van der Stouwe et al 2014)
- Self-guided change (Wagner et al 2015)
- Continuing care (Garner et al 2014; Godley et al 2014)
- Smartphone based recovery support (Dennis et al 2014)
- Working /therapeutic alliance and treatment satisfaction (Diamond et al 2006; Houge et al 2006; Tetzlaff et al, 2005)
- Family, peer and other environmental factors (Godley et al 2005; Wagner et al 2015)
Key Messages

• There are multiple other general factors that predict outcomes as much as the type of treatment:
  ▪ targeting those most in need for a service, use of evidence based treatment,
  ▪ use of fidelity based quality assurance and program monitoring,
  ▪ case management of the multiple co-occurring problems and services,

• Some studies also suggest key roles of multiple specific interventions, continuing care, recovery support services, therapeutic alliance, family factors, peers, and environment.
4. Emerging Issues related to value based contracting

How value based contracting is related to multi-morbidity, level of care, trauma informed care, costs of health care and crime, and technology assisted care
Value Based Contracting - Background

- Published health risk analytics are still in early stages for mental health and next to non-existent for substance use.
- Ideally it is useful to have a baseline period on the actual programs, population and measures proposed for value based contract.
- Useful to jump starting the process by using existing records data and/or other national data sets.
- Towards this end, ideally want a crosswalk of what is already being collected and identify gaps for behavioral health risk analytics and value based contracting.
- Value based contracting for other chronic disease management increasingly focuses incentives on reducing the cost of total health care utilization.
Health Risk Analytics

Cost of Past Health Care Utilization

Severity (symptom, diagnosis or problem count)

Cost of Future Health Care Utilization
Profile and Count of Major Clinical Problems of 13,989 Adolescents Presenting to SUD Treatment: CSAT grants

- Cannabis Problem: 67%
- Tobacco Problem: 64%
- Alcohol Problem: 30%
- Stimulant Problem: 11%
- Opioid Problem: 6%
- Any Other Drug Problems: 8%
- Conduct Disorder: 48%
- Attention Deficit Hyperactivity Disorder: 40%
- Depression / Mood: 34%
- Trauma / PTSD: 23%
- Anxiety / Phobia: 11%
- Suicidal: 11%
- Physical Health Problems: 48%
- Physical Violence: 67%
- Illegal Activity: 64%
- Victimization: 59%
- Count of Above Problems:
  - None: 3%
  - 1: 7%
  - 2: 9%
  - 3: 11%
  - 4: 11%
  - 5 to 16: 59%

Source: Baumer, Dennis & Estrada (in press) and SAMHSA 2012 GAIN Summary Analytic Data Set Adolescents only (n=13,989)
Count of 16 Common Clinical Problems at Intake: by Level of Care

Number of problems go up with level of care

Source: Baumer, Dennis & Estrada (in press) and SAMHSA 2012 GAIN Summary Analytic Data Set Adolescents only (n=13,989)
Count of 16 Common Clinical Problems at Intake: by Substance Problem

Severity higher for stimulants, opioids and other drugs

Source: Baumer, Dennis & Estrada (in press) and SAMHSA 2012 GAIN Summary Analytic Data Set Adolescents only (n=13,989)
Count of 16 Common Clinical Problems at Intake: by Level of Trauma/Victimization

Multi-morbidity even more related to severity of trauma

% of Youth within Level of Traumatic Victimization

Low (0) (OR=1.0) 28%
Moderate (1-3) (OR=1.8) 64%
High (4-15) (OP=13.1) 84%

Source: Baumer, Dennis & Estrada (in press) and SAMHSA 2012 GAIN Summary Analytic Data Set Adolescents only (n=13,989)
Cost of Health Care Utilization in 2016 Dollars

% of Population (n=13,475)
- 10%
- 67%
- 23%

% of Total Dollars ($118,485,948; mean=$8,793)
- 69%
- 31%

10% of the adolescents consumed 69% of the health care dollars

Source: Baumer, Dennis & Estrada (in press) and SAMHSA 2012 GAIN Summary Analytic Data Set Adolescents only (n=13,989)
Mean and High Cost Healthcare Utilization in the year before Intake by Level of Care

Cost of health care goes up with level of care

Source: Baumer, Dennis & Estrada (in press) and SAMHSA 2012 GAIN Summary Analytic Data Set Adolescents only (n=13,989)
Cost of Crime to Society in 2016 Dollars

11% of the adolescents generated 92% of the cost of crime dollars.

Source: Baumer, Dennis & Estrada (in press) and SAMHSA 2012 GAIN Summary Analytic Data Set Adolescents only (n=13,989)
Mean and High Costs of Crime in the year before Intake by Level of Care

Cost of crime goes up with level of care

<table>
<thead>
<tr>
<th>Level of Care</th>
<th>Mean Cost ($)</th>
<th>High Cost (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outpatient (OR=1.0)</td>
<td>$362,950</td>
<td>8%</td>
</tr>
<tr>
<td>IOP (OR=1.4)</td>
<td>$569,721</td>
<td>11%</td>
</tr>
<tr>
<td>OP-CC (OR=2.3)</td>
<td>$674,994</td>
<td>17%</td>
</tr>
<tr>
<td>Resid. (OP=3.4)</td>
<td>$1,195,489</td>
<td>24%</td>
</tr>
</tbody>
</table>

Source: Baumer, Dennis & Estrada (in press) and SAMHSA 2012 GAIN Summary Analytic Data Set Adolescents only (n=13,989)
Not the same groups

Under a third are low cost on both

Two thirds have moderate or high costs, 4% high on both

Cost of Health Care Utilization

Low HCU

Mod HCU

High HCU

Cost of Crime

Low CC

Mod CC

Source: SAMHSA Summary Analytic Data Set (n=19,469)
Differences in Common Treatment Process Outcomes By Level of Care

These CSAT grantees are better than average and generally do well with mixed differences by level of care.

Source: Baumer, Dennis & Estrada (in press) and SAMHSA 2012 GAIN Summary Analytic Data Set Adolescents only (n=13,989)
NOMS Positive Outcomes at Intake (blue) and 6 Months Follow-up (green)

Source: Baumer, Dennis & Estrada (in press) and SAMHSA 2012 GAIN Summary Analytic Data Set Adolescents only (n=13,989)
Change NOMS Positive Outcomes*  
(Last FU–Intake)

* Based on count of positive outcomes at the last wave minus the number of problems at intake.

79% have one or more improved areas, including 57% with 3 or more improved areas

Source: Baumer, Dennis & Estrada (in press) and SAMHSA 2012 GAIN Summary Analytic Data Set Adolescents only (n=13,989)
Change in Count of NOMS Outcomes by Level of Care

<table>
<thead>
<tr>
<th></th>
<th>Intake</th>
<th>6 Months</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>5.8</td>
<td>8.80</td>
</tr>
<tr>
<td>(d=-1.22)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Outpatient</td>
<td>6.0</td>
<td>8.90</td>
</tr>
<tr>
<td>(d=-1.22)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IOP</td>
<td>5.9</td>
<td>8.93</td>
</tr>
<tr>
<td>(d=-1.21)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OP-CC</td>
<td>6.1</td>
<td>8.41</td>
</tr>
<tr>
<td>(d=0.93)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Residential</td>
<td>4.8</td>
<td>8.56</td>
</tr>
<tr>
<td>(d=1.54)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Large Effects

Source: Baumer, Dennis & Estrada (in press) and SAMHSA 2012 GAIN Summary Analytic Data Set Adolescents only (n=13,989)
7 Reviews and formal meta analyzes across studies have found that...

- Technology based prevention, treatment and recovery support services as adjuncts can improve treatment satisfaction and outcomes
- Can work as well or slightly better than traditional human delivery of services
- Meta analyses of ecological momentary interventions across multiple platforms (e.g., SMS, IVR, smartphones) and health outcomes have generally found positive effects.
- Similar results for the limited number of smartphone studies to date.
- Problem is that technology continues to advance quickly and few of these are commercially available yet

Some Key Resources for Evidence Based Practices that are available NOW

Computer-Based Training for Cognitive Behavioral Therapy at www.CBT4CBT.com

Technology Assisted Care for Substance Use Disorders at WWW.SUDTECH.ORG

Addiction Comprehensive Health Enhancement Support System (ACHESS) at www.chessmobilehealth.com

Global Appraisal of Individual Needs (GAIN) Coordinating Center at www.gaincc.org
Key Messages

• The norm is for adolescents to present with multiple co-occurring problems, including:
  • Multiple SUD
  • Other Mental Health Disorders,
  • Physical Health Disorders,
  • Crime/violence, and
  • Environmental Problems

• Level of care, substance problem and trauma are related to higher multi-morbidity

• Costs of health care and crime are very skewed and driven by subsets of the adolescents

• Treatment programs can do well on process outcomes

• Treatment programs can be associated with improvement in multiple areas on average

• Technology assisted care can play a role in improving access, effectiveness and cost-effectiveness
Other resources available on conference website

- A copy of these slides (including its bibliography) – you are welcome to use and share them.

- A guide to adolescent evidenced based treatment listing the major practices, where to get the manuals, training, and the data behind them.

- A guide to parent resources including resources that they can access, information on SAMHSA’s free on-line parent training, and answers to common questions.
Questions?

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More information on the GAIN is available at [www.gaincc.org](http://www.gaincc.org) or by e-mailing [gaininfo@chestnut.org](mailto:gaininfo@chestnut.org)
References Cited


References Cited (continued)


GAIN Coordinating Center (2013) 2012 GAIN AT Summary Analytic Data Set. See [www.gaincc.org/slides](http://www.gaincc.org/slides).


References Cited (continued)


References Cited (continued)


