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Moderator

David Marimon
Policy Analyst
National Criminal Justice Association

Presenters

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Yale University School of Medicine

Nancy M. Petry, Ph.D.
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CBT4CBT

Computer-Based Training for Cognitive Behavioral Therapy

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Overview

- Why computer-based delivery of CBT?
- Overview of CBT4CBT
- Supporting evidence
- Ongoing work and opportunities for collaboration
Cognitive-behavioral Therapy: CBT

Based on functional analysis of substance use
Emphasis on learning/implementation of coping skills

- Functional analysis and patterns of use
- Coping with craving
- Addressing ambivalence and coping with thoughts
- Refusal skills
- Seemingly irrelevant decisions
- Problem solving skills
CARROLL ET AL (1994) Arch Gen Psychiatry, 121 cocaine users, 1 year follow-up
Cognitive behavioral therapy

- Empirically validated therapy
- Safe, broadly effective across many populations (including criminal justice)
- Durable effects

Challenges to dissemination
- Training time, clinician turnover
- Complexity
- Weak fidelity
- Limited clinician time, access
Why computer facilitated delivery of evidenced based treatments?

• **Effective implementation of CBT very rare in clinical practice**
• Only a small fraction of people with addiction-related problems access treatment
• Save clinicians time, use as clinician extenders
• Broadly accessible, available 24/7
• Facilitated delivery via multimedia presentation
• Individualization, repetition, flexibility
• Facilitation of systematic evaluation of components (moderators & mechanisms of action)
• Standardization
Broadening the base

Intensity of behavior

Level of problems

Unmet need

Treated sample
Core principles: CBT4CBT development

- Highly engaging-capture attention of substance users, retain them in treatment
- Deliver potent dose of evidence based cognitive and behavioral strategies-focus on key generalizable skills
- Durability of effects-skills practice
- Modeling-demonstration of skills in realistic situations under stress
- Breadth of users-all drugs, balance of gender and ethnicity
- Security- NO identifying information, no HIPPA issues
‘CBT 4 CBT’
Computer Based training for CBT

- 7 modules, ~1 hour each, high flexibility
- Highly user friendly, no text to read, linear navigation
- Based on NIDA CBT manual
- Multiple strategies for presenting skills
- Video examples of characters struggling real life situations
- Repeat movie with character using skills to change ‘ending’
- Interactive exercises, quizzes
- Multiple examples of ‘homework’
Overview: First randomized clinical trial

- 8 week randomized clinical trial
- Outpatient community treatment program
- Standard treatment (weekly individual + group therapy) (TAU) vs. CBT4CBT + TAU
- CBT4CBT offered in up to 2 weekly sessions
- 6 month follow-up

Carroll et al., Am J Psychiatry, 2008
Participants, first trial

“All comers”: few restriction on participation, only require some drug use in past 30 days

- 43% female
- 45% African American, 12% Hispanic
- 23% employed
- 37% on probation/parole
- 59% primary cocaine problem, 18% alcohol, 16% opioids, 7% marijuana
- 79% users of more than one drug or alcohol
Primary outcome (% drug-positive urine toxicology screens), 8 weeks, CBT+TAU versus TAU

Carroll et al., 2008, Am J Psychiatry
Primary outcome: Longest consecutive abstinence, in days, at 8 weeks by condition

Carroll et al., 2008, *Am J Psychiatry*
Skill level though 6 month follow-up: Quality of best response by condition

Kiluk et al, Addiction, 2010
Quality of coping skills as mediator of outcome in CBT4CBT

Kiluk et al, *Addiction, 2010*
Durability of Effects: 6 month follow-up

Estimated Days of Any Drug Use from Treatment Endpoint to Follow-Up Month 6

Carroll et al., 2009, DAD
Comparison of cost to other empirically supported therapies when brought to scale: Olmstead et al., DAD, 2010  
(Outcome=Longest Days Abstinence (LDA) Incremental Cost Effectiveness Ratios (ICERS))

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Base Case ($)</th>
<th>Favorable Scenario ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CBT4CBT</td>
<td>50</td>
<td>-31</td>
</tr>
<tr>
<td>MET/CBT&lt;sup&gt;a&lt;/sup&gt;</td>
<td>102</td>
<td>77</td>
</tr>
<tr>
<td>Prize CM – MM&lt;sup&gt;b&lt;/sup&gt;</td>
<td>141</td>
<td>115</td>
</tr>
<tr>
<td>Prize CM – DF&lt;sup&gt;c&lt;/sup&gt;</td>
<td>258</td>
<td>163</td>
</tr>
</tbody>
</table>

<sup>a</sup>MET/CBT = motivational enhancement therapy + clinician-delivered CBT  
<sup>b</sup>Prize CM – MM = prize-based contingency management in methadone clinics  
<sup>c</sup>Prize CM – DF = prize-based contingency management in drug free clinics
Overview: Second randomized trial

- 101 DSM-IV cocaine-dependent methadone maintained opioid users population

- Standard methadone maintenance (TAU) vs. CBT4CBT + TAU, 6 month follow-up

- Sample: 60% female, 40% minority, 89% unemployed, higher levels psychiatric comorbidity (29% depressive disorder, 30% anxiety disorder), multiple other substance use

Carroll et al., Am J Psychiatry, in press
Primary post treatment outcomes: Cocaine-MMP sample

Carroll et al., in press
Change over time by group-
Within treatment and 6 month fup
Changes in brain activity via fMRI:
Comparison of Post- to Pretreatment, CBT4CBT versus TAU

Stroop related activity dIPFC decreases from pre- to post-
CBT4CBT but not TAU

CBT Stroop Post > Pre
TAU Stroop Post > Pre

pFWE=.05
X=-21
Days in jail during 6 month follow-up by treatment condition (P < .05)
Kober Regulation of Craving Task: Preliminary data, N=11

Activity in dorsolateral PFC correlates with regulation success:
Greater activity pre-treatment → Better regulation → Lower craving

Increases in dIPFC activity correlate with decreased craving (effective regulation)

Activity in dorsolateral PFC correlates with regulation success:
Greater activity pre-treatment → Better regulation → Lower craving
Status: CBT4CBT

- **Completed:**
  - 2 RCTs indicating efficacy and durability of CBT4CBT
    - No treatment related adverse effects
    - Variety of populations: Outpatient, methadone maintenance, and VA
    - Demonstration of skill acquisition, cost effectiveness and durability

- **Ongoing:**
  - P50 Center: Enhance CBT4CBT outcome with galantamine (placebo controlled RCT), fMRI, neurocog, genetics (RNP, Bridgeport)
  - Evaluation of HIV module on drug/sex risk reduction (Hartford Dispens)
  - Man versus Machine: CBT4CBT versus traditional therapist delivery (SATU)
  - New R01 (Potenza)/Carroll): Neural mechanisms of the Sleeper Effect
  - Validation of alcohol-only versions (SATU)

- **Initiated January 2014 randomized trial of Spanish version (Paris, Silva, Anez, Ortega)**
CBT4CBT :: Reconociendo los desencadenantes - Windows Internet Explorer provided by Yab Managed Workstation

Página Principal > Reconociendo los desencadenantes

Haciendo valer tu punto de vista
Manejo el dese de beber o consumir
Para y piénsalo bien
Resolviendo los problemas
Nadando contra la corriente
Practicando responsabilidad

Reconocer
Evitar
Manejar

Página Principal
Reiniciar Tema
Ayuda
Reiniciar Página

Pág. 5 de 27
Potential uses of computer-assisted therapies

- Extending treatment benefits/ links to aftercare
- Clinician extenders
- Additional patient support
- Ongoing monitoring/relapse prevention
- Address overlooked issues (smoking)
- Linking systems of care
- Behavioral platforms for pharmacotherapies
- Early intervention/prevention for mild cases
Thanks.

What’s next? Integration in clinical practice, research on effectiveness in other settings:

- **Kathleen.carroll@yale.edu**

- Links to our work in therapy development, manuals, training tapes, publications:  [www.pdc.yale.edu](http://www.pdc.yale.edu)

- More information on CBT4CBT and access to demo:
  - CBT4CBT.com
Improving substance abuse treatment outcomes with contingency management: A focus on the CJ population

Nancy M. Petry, Ph.D.
Professor of Medicine
University of Connecticut Health Center

Supported by NIH grants P30-DA023918, P50-DA09241, R01-DA13444, R01-DA016855, R01-DA14618, R01-DA018883, R01-DA022739, R01-DA027615, P60-AA03510
Outline

1) Punishers and reinforcers
2) Prize CM
3) CM for criminal justice system populations
Punishers are most often used in substance abuse treatment.
Examples of positive reinforcers used in substance abuse treatment

**AA**
- coffee, food
- group recognition and approval
- 30-day pins/certificates
- act as sponsor for others

**Out-patient treatment**
- certificates, praise

**Methadone maintenance**
- take-home doses
- early dosing windows
Why are reinforcers and punishers often ineffective in changing substance use?

- Often, behaviors are not specifically defined.
- The same reinforcers and punishers may be provided for a variety of different behaviors.
- Consequences may not be applied for each instance of the behavior.
- Tangible reinforcers are rarely utilized.

Although both can be effective, everyone would rather receive reinforcers rather than punishers.
Contingency management principles

1. Frequently monitor a specific *objective* target behavior.

2. Provide tangible positive reinforcement *each time* the target behavior occurs.

3. Withhold reinforcement if the target behavior does not occur (slight punisher).
Prize-based contingency management (CM)

Reinforce abstinence frequently (2-3 times per week):
- One draw for each negative sample provided.
- Draws escalate for consecutive negative samples.
Half the cards are winning

- ~1/2 chance of winning a small $1 prize
- ~1/13 chance of winning a large $20 prize
- 1/500 chance of winning a jumbo $100 prize
Sample cabinets
Initial study with alcohol dependent patients

Retention

% Retained

CM
Standard

weeks

p<.05

Time until first heavy drinking episode

Does prize CM work with cocaine-dependent patients, and will it work nationwide?

National Drug Abuse Clinical Trials Network
A research infrastructure of universities and community clinics across 27 states, DC, & Puerto Rico
Results from CTN outpatient sample

Remained 12 weeks in treatment

- Prize CM: p<.05
- Standard

≥8 Weeks of stimulant abstinence

- Prize CM: p<.05
- Standard

Petry et al. (2005). Archives of General Psychiatry
CTN methadone sample

Percent achieving ≥ 8 weeks of stimulant abstinence

Prize CM

Standard

Prize CM enhances abstinence from:

- Alcohol (Petry et al., 2000)
- Smoking (Alessi et al., 2008; Ledgerwood et al., in press)
- Marijuana (Kadden et al., 2007; Litt et al., 2013)
- Stimulants, including methamphetamine (Petry et al., 2003, 2005ab, 2006, 2011, 2012abc; Roll et al., 2006)
- Polydrug use, including in opioid-dependent samples (Ghitza et al., 2008; Peirce et al., 2006; Petry et al., 2002, 2005c, 2007, 2012c).

Costs are reasonable (about $50-$200/patient), and prize CM is cost-effective (Lott & Jencius, 2009; Olmstead et al., 2007ab, 2009; Sindelar et al., 2007ab).

Further dissemination of prize CM interventions into usual care treatment is ongoing.

The VA is implementing CM nationwide (Petry et al., in press).
CM in criminal justice system populations
Young marijuana users are difficult to engage in treatment, even when referred by CJ systems.

65 probation referred marijuana users

- Mean age 20+2 years
- 93% male
- 77% minority
- 74% unemployed
- 59% did not complete high school
Results

Sessions attended

<table>
<thead>
<tr>
<th>Mean</th>
<th>MET</th>
<th>MET+CM</th>
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<tbody>
<tr>
<td>p=.08</td>
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Attended all sessions

<table>
<thead>
<tr>
<th>%</th>
<th>MET</th>
<th>MET+CM</th>
</tr>
</thead>
<tbody>
<tr>
<td>p&lt;.05</td>
<td>25</td>
<td>50</td>
</tr>
</tbody>
</table>

Sinha et al. (2003).
136 probation referred marijuana users

- Mean age 21 ± 2 years
- 89% male
- 75% minority
- 47% did not complete high school
- 23% with alcohol use diagnosis
- 44% with antisocial personality disorder
Results

Sessions attended

Longest duration THC abstinence (days)

Carroll et al. (2006).
CM is effective for treating substance use, even in difficult criminal justice system populations.

Adoption of positive reinforcement procedures may hold promise for improving outcomes in the criminal justice system itself.
For more information, visit:

http://contingencymanagement.uchc.edu/

Manuals are available for how to deliver CM.

For a step-by-step guide to designing CM programs for clinical settings:

To submit questions for the presenters please use the chat feature on the right hand side of your screen. Please select Host and Presenter.
Q & A

Moderator

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THANK YOU
FOR JOINING US

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