Computer-based training for cognitive behavioral therapy: CBT4CBT

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Cognitive behavioral therapy

- Empirically validated therapy
- Safe, broadly effective
- Durable effects

Challenges to dissemination

- Training time, clinician turnover
- Complexity
- Limited clinician time
- “Weak delivery”

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
- Rural, underserved populations
- 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

‘CBT 4 CBT’
Computer Based training for CBT

- 7 modules, ~1 hour each, high flexibility
- Highly user friendly, no text to read, linear navigation
- Video examples of characters struggling real life situations
- Multimedia presentation of skills
- Repeat movie with character using skills to change ‘ending’
- Interactive exercises, quizzes
- Multiple examples of ‘homework’

Overview: 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

- Option of fMRI studies

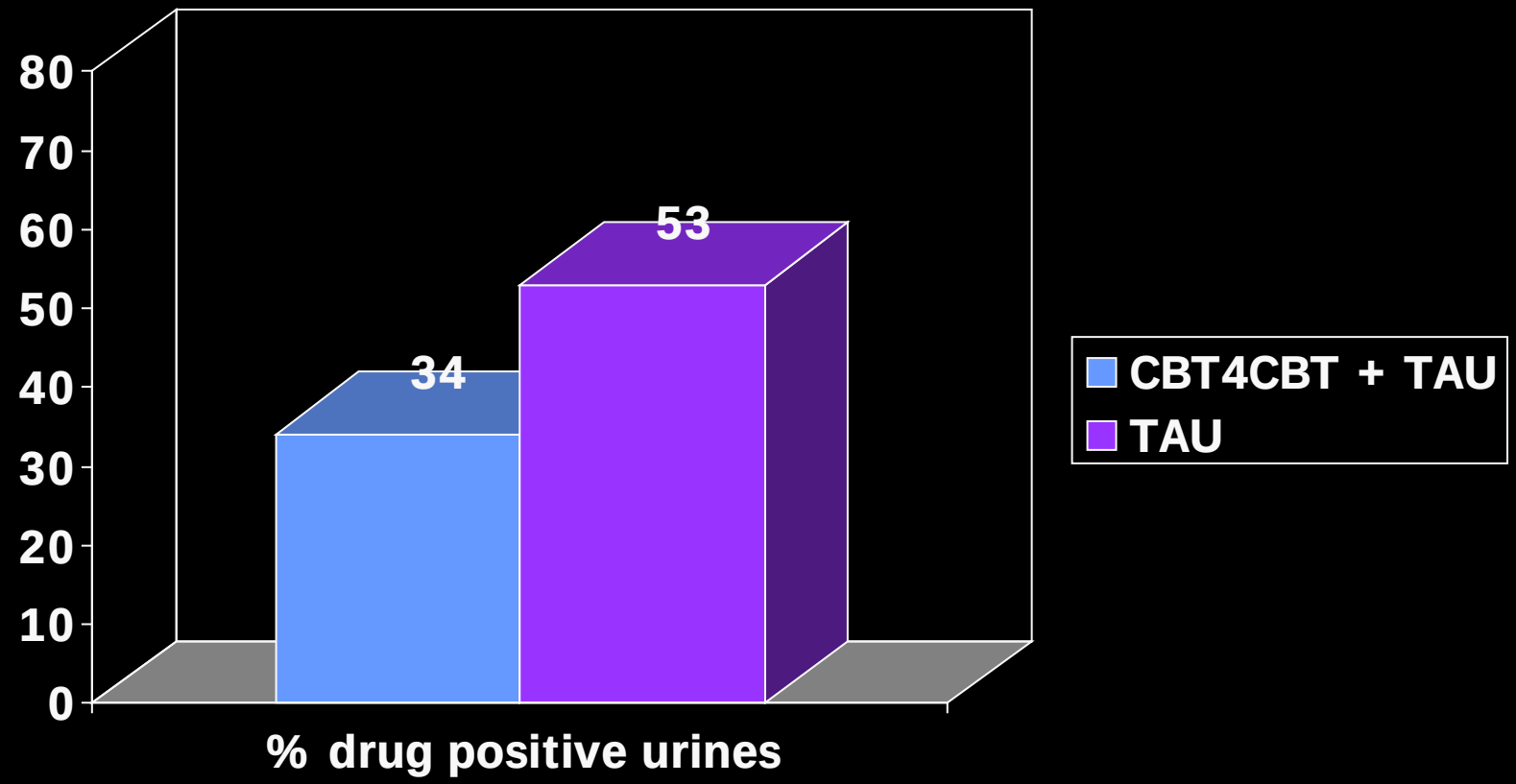
Carroll et al., Am J Psychiatry, 2008

Participants, N=78

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

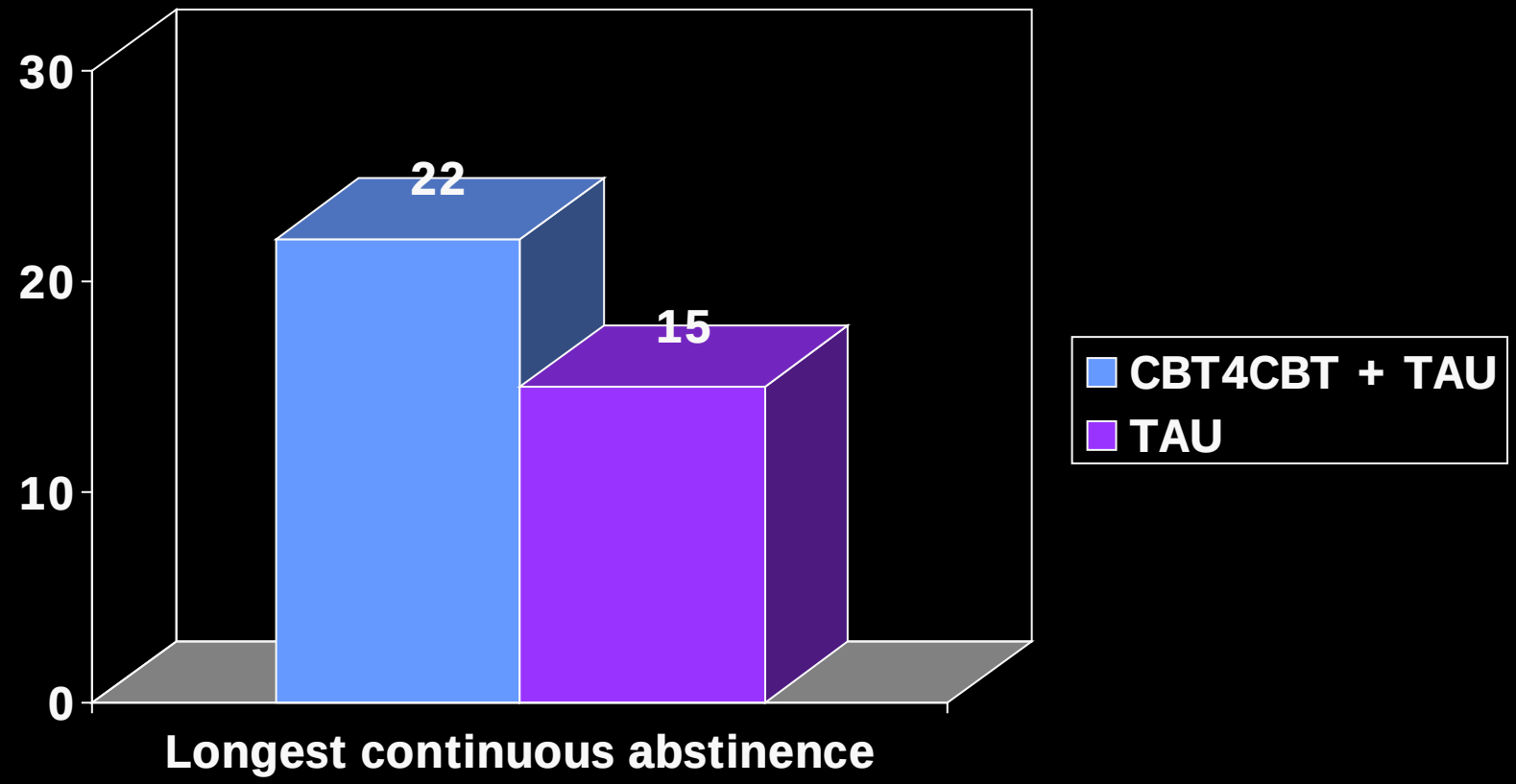
- 43% female
- 45% African American, 12% Hispanic
- 23% employed
- 37% on probation/parole
- 59% primary cocaine problem, 18% alcohol, 16% opioids, 7% marijuana
- 79% users of more than one drug or alcohol

Primary outcomes, 8 weeks
CBT+TAU versus TAU



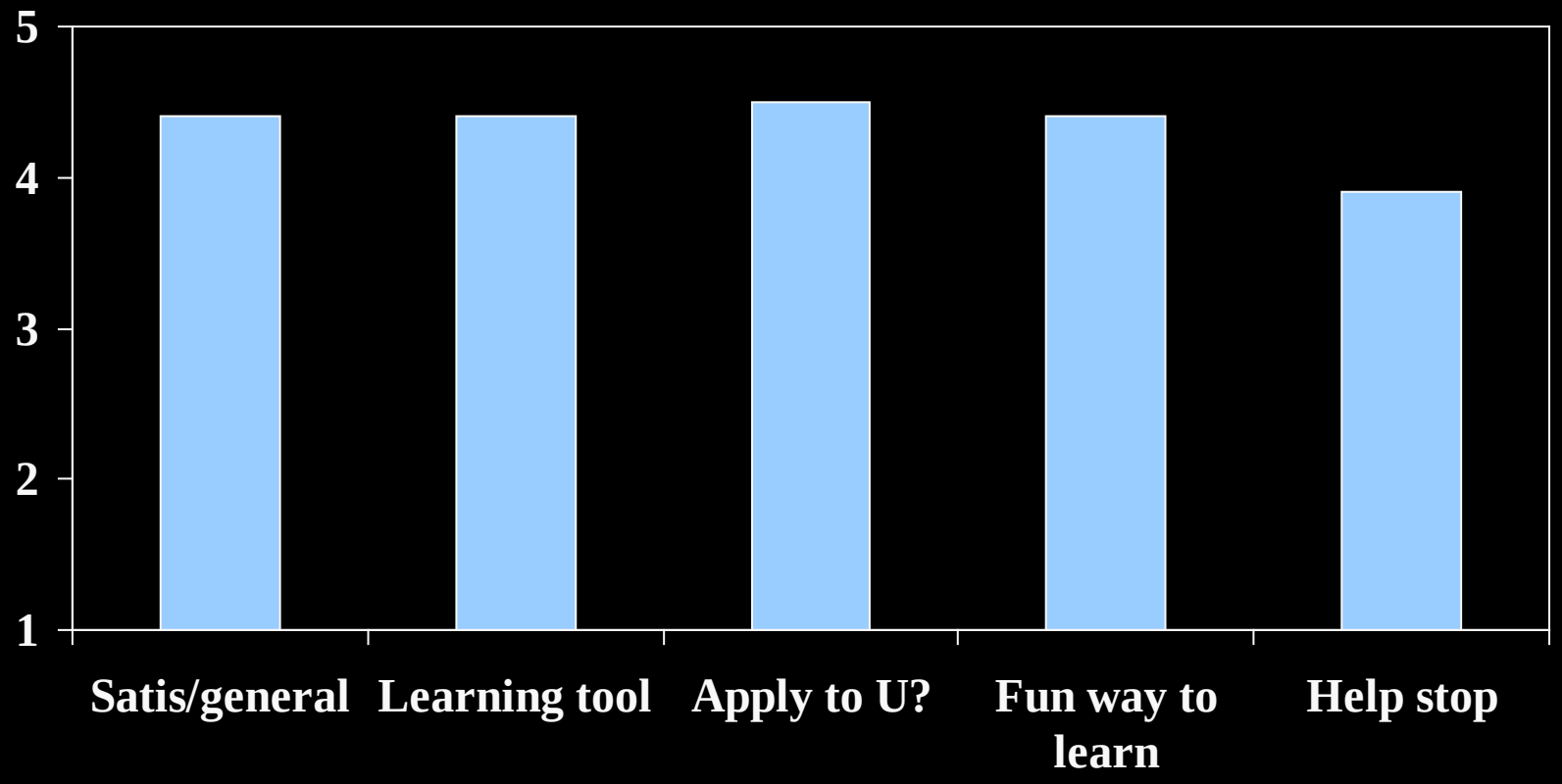
Carroll et al., 2008, *Am J Psychiatry*

Primary outcome: Longest consecutive abstinence, in days, at 8 weeks by condition



Carroll et al., 2008, *Am J Psychiatry*

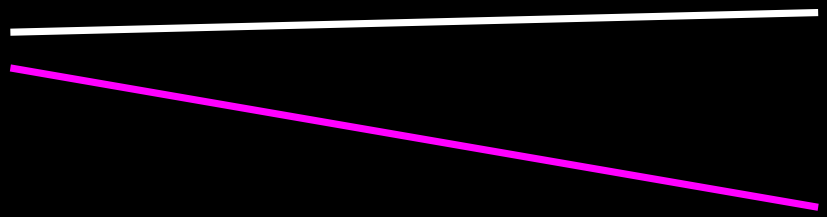
Participants' satisfaction w/CBT4CBT:
"I think my computer loves me"



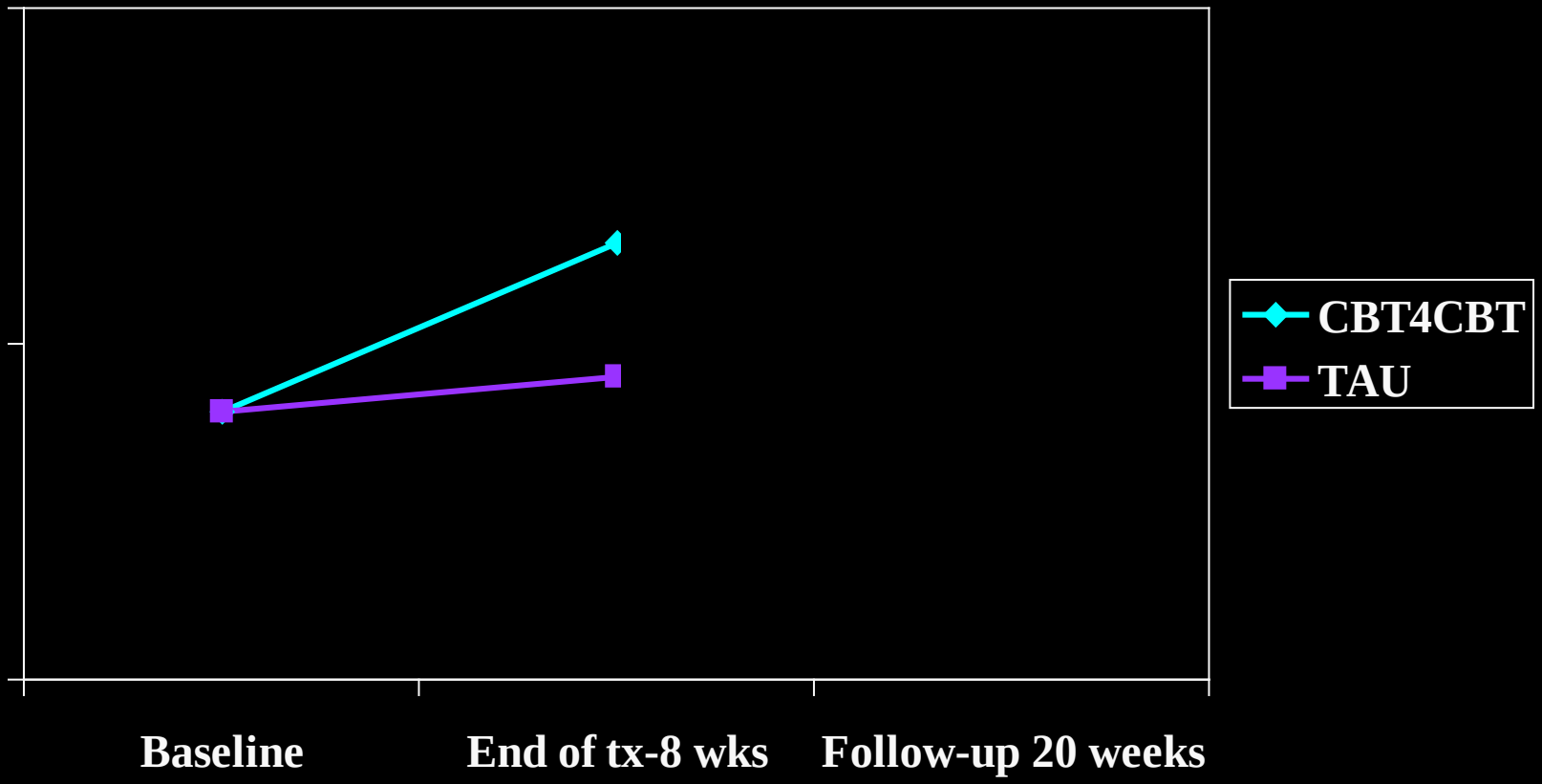
Carroll et al., 2008, *Am J Psychiatry*

Does CBT4CBT resemble traditional clinician-delivered CBT?

1. Does the program actually teach the intended skills?
2. Does acquisition of coping skills affect drug use outcomes?
3. Does it have durable (sleeper) effects?

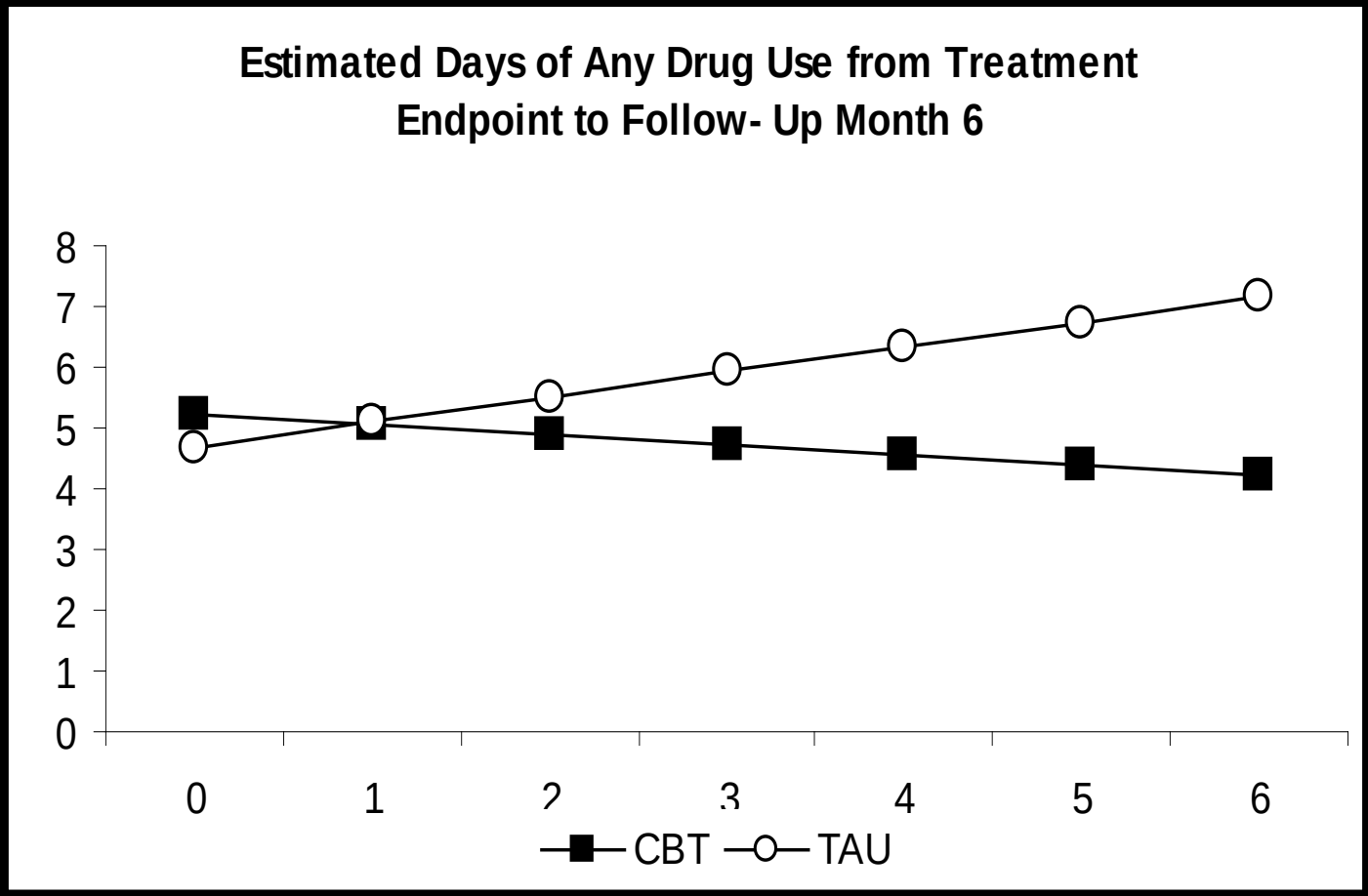


Acquisition of coping skills by condition Independent ratings, role play task



Kiluk et al, Addiction, 2010

Durability of Effects: 6 month follow-up



Carroll et al., 2009, DAD

Comparison of Cost Effectiveness across Treatments and Studies

Outcome=Longest Days Abstinence (LDA) Incremental Cost Effectiveness Ratios (ICERS)

Treatment	Base Case ($)	Favorable Scenario ($)
CBT4CBT	50	-31
MET/CBT[a]	102	77
Prize CM: meth maint.	141	115
Prize CM: outpatient	258	163

Olmstead & Carroll, 2010, Drug Alc Dependence

Ongoing studies: CBT4CBT

Ongoing larger trial of CBT4CBT, test of HIV module (NIDA R37),

- Target N=100; current 99 randomized
- Includes fMRI + genetics (Potenza, Kober)
- Understanding CBT concepts (Kiluk)

- P50 Center: Enhance CBT4CBT outcome with galantamine

  Initiated 9/10, 5 year trial, cocaine/methadone population

  fMRI: Regulation of craving task: Kober

- VA CSP 582: TAU versus TAU+CBT4CBT versus CBT4CBT alone

- RO1: Man versus Machine: CBT4CBT versus traditional therapist delivery

Pending:

- Spanish version
- Evaluation of HIV component on HIV risk reduction

Potential advantages of computer-assisted therapies

- Anytime, anyplace, 24/7
- 10% of those who need treatment seek or access it, but 75% in US have internet access
- Privacy, discrimination
- Rural populations, limited mobility
- Clinician shortages
- Standardization, fidelity, quality
- Challenges of mastering multiple EBTs
- Cost

So *now* what?

- Broad release to anyone/everyone?
- Should we assume efficacy and safety of all computer-assisted therapies?
- Should we assume ‘anything’ is better than nothing?
- Are there possible harms of premature broad release of computer assisted therapies?
  - ‘Giving up’ prematurely
  - Not seeking professional help when needed
  - Lacking monitoring
  - Misinterpreting principles, interventions
  - Confidentiality
- Computer-assisted only means that ‘something’ is delivered via computer, not efficacy of that ‘something’

Methodological analysis of computer-assisted therapies

Kiluk, Sugarman, Nich, Gibbons, Martino, Rounsaville & Carroll, American Journal of Psychiatry, 2011

Study Identification

- PubMed, Scopus, Psychabstracts
- Meta-analyses, systematic review

Inclusion:

- RCTs with pre-post evaluation
- Used computer to deliver intervention
- Targeted adults (>18) with mental health disorder or problem

Exclusion:

- Prevention studies
- Single session assessment and feedback
- Did not report symptom outcome (e.g., process studies, etc.)
- E-therapy (delivered by clinician via e-mail)

130 studies, 75 met criteria


"On the Internet, nobody knows you're a dog."

Aggregate characteristics: N=75

Issue	Criteria	%
1. Randomization	0. No randomization	0
	1. Unspecified method	27
	2. Specified and reported	73
2. Follow-up	0. None	35
	1. Follow-up after posttreatment	51
	2. Follow up of >80% of sample	15
3. Assessment	0. Self report only	67
	1. Outcome interview	21
	2. Independent, masked interview	12
4. Sample size	0. Small (<20/group)	23
	1. Moderate (20-50/group)	35
	2. Large (>50/group)	43

Issue	Criteria	%
5. Statistical	0. Weak	9
approach	1. Reasonable	76
	2. Strong, sophisticated	15
6. Missing data	0. Inappropriate/not described	40
	1. Imputations	47
	2. Intention to treat	13
7. Defined clinical	0. No criteria	7
issue	1. Cut-off score	41
	2. Diagnostic interview	52
8. Control condition	0. Wait list	23
*(strongest if >1)	1. Attention/ education	41
	2. Active	36

Issue	Criteria	%
9. Outcome	0. Unvalidated measure	9
measure	1. Self-report only	65
	2. Independent or biological	25
10. Adherence /	0. No measure	27
internal validity	1. Compliance/exposure measure	49
	2. Considered in analysis	24
11. Credibility	0. No measure	76
measure	1. Some measure	15
	2. Reported comparable	9

Bottom line findings

- No study meets minimal methodological standards on all 14 criteria
  - Three meet all all but one (13/14)
- NO studies report on adverse events
- Common problems: No evaluation of integrity compliance/exposure, no follow-up
- Common design: Wait list control, outcomes self-report only (100% of wait list), high attrition, little follow-up
- Few studies compare computer-assisted to therapist delivered version of same intervention, none with adequate sample size

Conclusions: Methodologic analysis

- State of science for computer-assisted therapies for adult mental health disorder reminiscent of early stages of behavioral therapies research
- Clinician involvement associated with better outcome
- Our excitement regarding new technologies should be balanced with careful evaluation of methodological quality, safety
- Caveat emptor!