Development of Automated, Mobile Treatment Systems for Opioid Dependence

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Type and Context of Opioid Agonist Treatment

- Traditional Methadone Clinics
- Buprenorphine in Primary Care Settings
Obstacles to traditional behavioral treatments

- Costs
- Training and supervision of counseling
- Staff interest and training
- Space – availability and scheduling
- Coordination with off-site counseling
- Patient conflicts – travel distance, employment schedule, child care, etc.
Advantages of Automated Mobile Treatments

- Offers potential for many therapeutic interactions
- In-situ - Potential for immediate intervention when needed
- High confidentiality
- Low cost
- Consistent presentation
- Increased availability of treatment for rural and remote settings
Therapeutic Interactive Voice Response (TIVR)

- Low Cost – Centralized system
- Mobile - highly flexibility and convenient
  - Available 24 hours/day
  - Available for any phone anywhere
  - In patient’s natural environment. Can be used to intervene before use or relapse
- High accessibility – rural, remote and places with low access to treatment or few trained providers.
- Low “high tech” –
  - More secure and less open to attacks than web or mobile web systems
- Easy to adapt and change content based on feedback and updates in the science
Development Procedures

Generation and Editing

Initial Generation based on CBT manuals

- Review from Plain Language
- Methadone system adapted and reedited for content and format

Counselor Acceptability and Feasibility
Qualitative and Quantitative data for system modification

- Buprenorphine CBT Counselors
- Methadone Counselors

Experienced Patient Acceptability and Feasibility
Qualitative and Quantitative data for system modification

- Buprenorphine Patient Single session review then 1 week access
- Experienced Methadone Patients 1 week access

Criteria of 50% ratings of 4 or 5 (5 pt) for interest, helpfulness and ease of use*

- Iterative Editing and Testing to Criteria

New Patients - Randomized Pilot
Outcomes - Coping Skills, Retention, Satisfaction, Drug use

- Buprenorphine Patients Staring Treatment
- New Methadone Patients

* Yale School of Medicine
Acceptability and Feasibility Criteria

• Acceptability
  – On a 5 point Likert scale 1-5, 50% of ratings of 4 or 5
    • Interest
    • Helpfulness
    • Ease of Use

• Feasibility for 7 day access
  – Majority (> 50%) of patients >30 minutes of system contact time
  – Majority (> 50%) of patients call on more than 50% of days
Substance Abuse Counselors

Reviewed the system and provided feedback regarding system acceptability and system content.

Buprenorphine:
- CBT therapists experienced in treating patients with opioid dependence
- N=6

Results:
**Acceptability criteria met.**
- Interest, 83% 4 or 5, M=4.1, Median=4.0
- Helpfulness, 67% 4 or 5, M=3.8, Median=4.0
- Ease of Use, 100% 4 or 5, M=4.3, Median=4.0

Methadone:
- Clinic methadone counselors experienced in treating patients in methadone maintenance
- N=9

Results:
**Acceptability criteria met.**
- Interest, 86% 4 or 5, M=4.0, Median 4.0
- Helpfulness, 86% 4 or 5, M = 4.0, Median 4.0
- Ease of Use, 86% 4 or 5, , Mean = 4.4, Median 5.0
Patient Acceptability Testing

Patients currently prescribed buprenorphine or methadone reviewed the system and provided feedback regarding acceptability and system content.

**Buprenorphine:**
N= 16 patients

**Acceptability criteria met.**
- Interest, 69% 4 or 5, M = 3.8, SD=1.1
- Helpfulness, 81% 4 or 5, M =4.2, SD=0.8
- Ease of system use, 89% 4 or 5, M =4.4, SD=1.2

**Methadone :**
N= 12 patients

**Acceptability criteria met.**
- Interest, 67% 4 or 5, M = 3.8, SD=1.4
- Helpfulness, 50% 4 or 5, M =3.6, SD=1.2
- Ease of system use, 92% 4 or 5, M =4.4, SD=0.9
System Modifications

- No machine-generated voices
- Brief modules (5-10 minutes)
- Patient driven rather than “session driven”
- Activities rather than skills practice
- Keep language simple/plain not “dumbed down”
- Interactive and engaging
- Encouragement
Patient Feasibility Testing

Patients currently prescribed opioid agonist medication were provided access to the Recovery Line for 7 days and asked to call daily.

• 19 Buprenorphine patients

Results:

Feasibility criteria met.

• 84% > 30 minutes contact time
  – Mean = 76 minutes
• Mean number of calls = 5.1
• 80% called more than 50% of days
• Mean call length = 10.5 minutes

• 12 Methadone patients

Results:

Feasibility criteria met.

• 100% > 30 minutes contact time
  – Mean = 82 minutes
• Mean number of calls = 7.2
• 92% called more than 50% of days
• Mean call length = 12.2 minutes
Post-Feasibility Testing Modifications

Buprenorphine System Edits
- Information About Buprenorphine Module
- 3 Daily Questions
- Level 2
  - Expanded sections and enhanced features (record a message section, encouragement)
  - Understanding Patterns to Use and Mindfulness Modules
- Menus divided for more clear presentation of options

Methadone System Edits:
- Addition of an Information About Methadone Module
- 3 Daily Questions
- Increased variety in voices (gender, ethnicity) recorded in modules
- Updated clinic information
- Removed Mindfulness With A Spoon Activity
  - Understanding Patterns to Use and Mindfulness Modules
Randomized Pilot for BUP and Methadone

- 4 weeks
- Recovery Line Access + Treatment as Usual (n = 16)
- or Treatment as Usual (n = 17)

Inclusion Criteria:
- Currently prescribed methadone or buprenorphine
- Used illicit drugs in the past 30 days (as evidenced by urine toxicology and/or self report)
- 18+ years old
- Can understand and read English

Exclusion Criteria:
- Current suicide or homicide risk
- Meets DSM-IV diagnosis for bipolar or psychotic disorder
- Medical complications that preclude participation
Days of Self-Reported Drug Use, p = .05

Prior to treatment
- RL + TAU: 12
- TAU only: 14

During Treatment
- RL + TAU: 6
- TAU only: 14

Conclusion:
- TAU only group has a higher days of self-reported drug use compared to the RL + TAU group before treatment.
- The difference decreases during treatment.
Outcomes

- **Urine Toxicology Screens**
  - Percent abstinence from all tested drugs, p = .19
    - RL + TAU - 48.8 (SD = 46.4)  \(\text{TAU} = 27.9 \text{ (SD = 40.4)}\)

- Number of drugs with positive tests each week, p = .16
  - RL + TAU - 0.79 (SD = 0.76)  \(\text{TAU} = 1.18 \text{ (SD = 0.76)}\)

- Situational Confidence in Avoiding Use(of 100%), p = .40
  - RL + TAU – 59.7 to 67.4  \(\text{TAU} – 58.1 \text{ to 59.0}\)

- 5 patients reported that they called the Recovery Line instead of using.
Call Details

- Mean calls per week = 4.5
- Mean call length = 9 minutes
- Mean total system contact = 194 minutes (30 to 337)

- Of 200 calls based on 16 patients
  - 25% (n = 50) reported using drugs since their last call.
    - 40% used urge surfing
    - 44% used recognizing triggers
Conclusion

• The Recovery Line for opioid dependent patients is acceptable and feasible for both buprenorphine and methadone patients

• Preliminary outcome findings are promising, though effect sizes may be smaller

• Low cost (~$10-20/patient/month) suggests the Recovery Line may be a cost effective means of providing ancillary treatment
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