# Individualized Texting for Adherence Building (iTAB) Improves cART adherence in HIV-infected Persons with Co-occurring Bipolar Disorder

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# HIV, Bipolar Disorder & Adherence

- **Among HIV+, ART adherence has improved with less complex regimens, but is still a problem**
- **40 - 60% of BD are non-adherent to psychotropics; nonadherent BD pts. are at higher risk of:**
  - » Relapse/Recurrence of mood episode
  - » Hospitalization
- **Risks for increased non-adherence in HIV+/BD+ include:**
  - » Incresed # of medications, mood instability, substance abuse/dependence, cognitive difficulties, etc.

## Public health importance of HIV+/BD+: Poor adherence → Worse health outcomes

Parienti et al., CID, 2009; Scott and Pope, Am. J. Psych., 2002; Li et al., 2002; Scott and Pope, JCP, 2002

# Texting Improves ART Adherence

- SMS (texting) interventions for improving ART adherence show promise
- In a 2012 Cochrane report, two RCTs shown to be efficacious for ART improvement:
  - » 1X week text over a 12-month interval decreased non-adherence and virologic failure (Lester et al., 2010)
  - » 1X week versus 1X day text messages; at 48-weeks, weekly messages were more likely to reduce non-adherence and treatment interruptions (Pop-Eleches et al., 2011)
- Optimal texting systems for adherence improvement in difficult-to-treat populations in US still evolving

Horvath et al., Cochran Report, 2012; Lester et al., 2010; Pop-Eleches et al. 2011

# Aim & Hypothesis

## AIM:

- To compare individualized texting for adherence building (iTAB) vs. active control (CTRL) on antiretroviral (ARV) and psychotropic (PSY) medication adherence among HIV-infected persons with co-occurring bipolar disorder (HIV+/BD+)

## HYPOTHESIS:

- Participants assigned to iTAB will show superior ARV and PSY adherence and better therapeutic coverage as compared to CTRL

# Personalized iTAB intervention

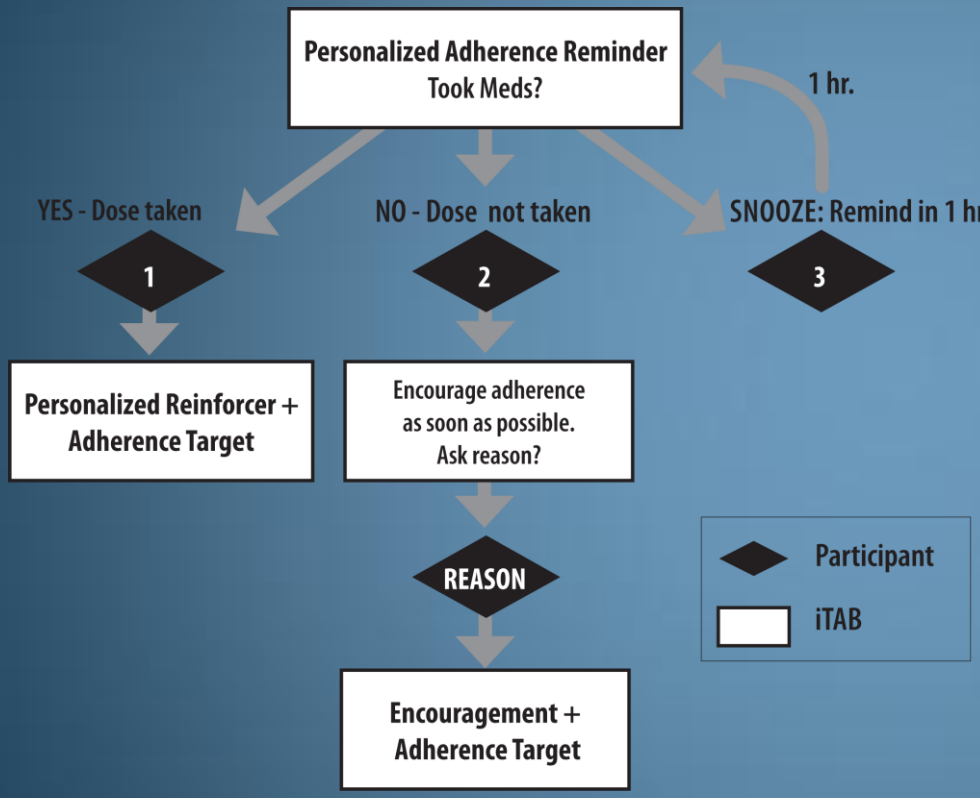
- Both iTAB and CTRL received:
  - Adherence psychoeducation (~30 min)
  - A daily text message asking about mood
  - Process of medication reminder creation
  - Identify sentinel med for MEMS: ARV: Mostly fixed-dose combination medication; PSY: Primary mood stabilizer
- **iTAB – Pts create personalized med reminder texts:**
  - Description of medications
  - Personalized reminder stems (e.g., "remember to take your meds, they make you healthy")
  - Preferred name
  - Ideal time for reminders each day by med

# iTAB Intervention Stems

**Stems of personal reminder messages reflect different themes:**

- **Celebrate Health**
  - Stay healthy! It's time 2 take ur meds, pls take ur…
- **Time and Focus**
  - It's pill time! Take ur…
- **Control Disease**
  - Taking ur meds helps control ur disease. Rmber 2 take ur…
- **Empowering**
  - It's med time, only u can control this. Rmber 2 take ur…
- **Importance of Adherence**
  - Adherence is impt. Pls take ur…

# iTAB Decision Tree



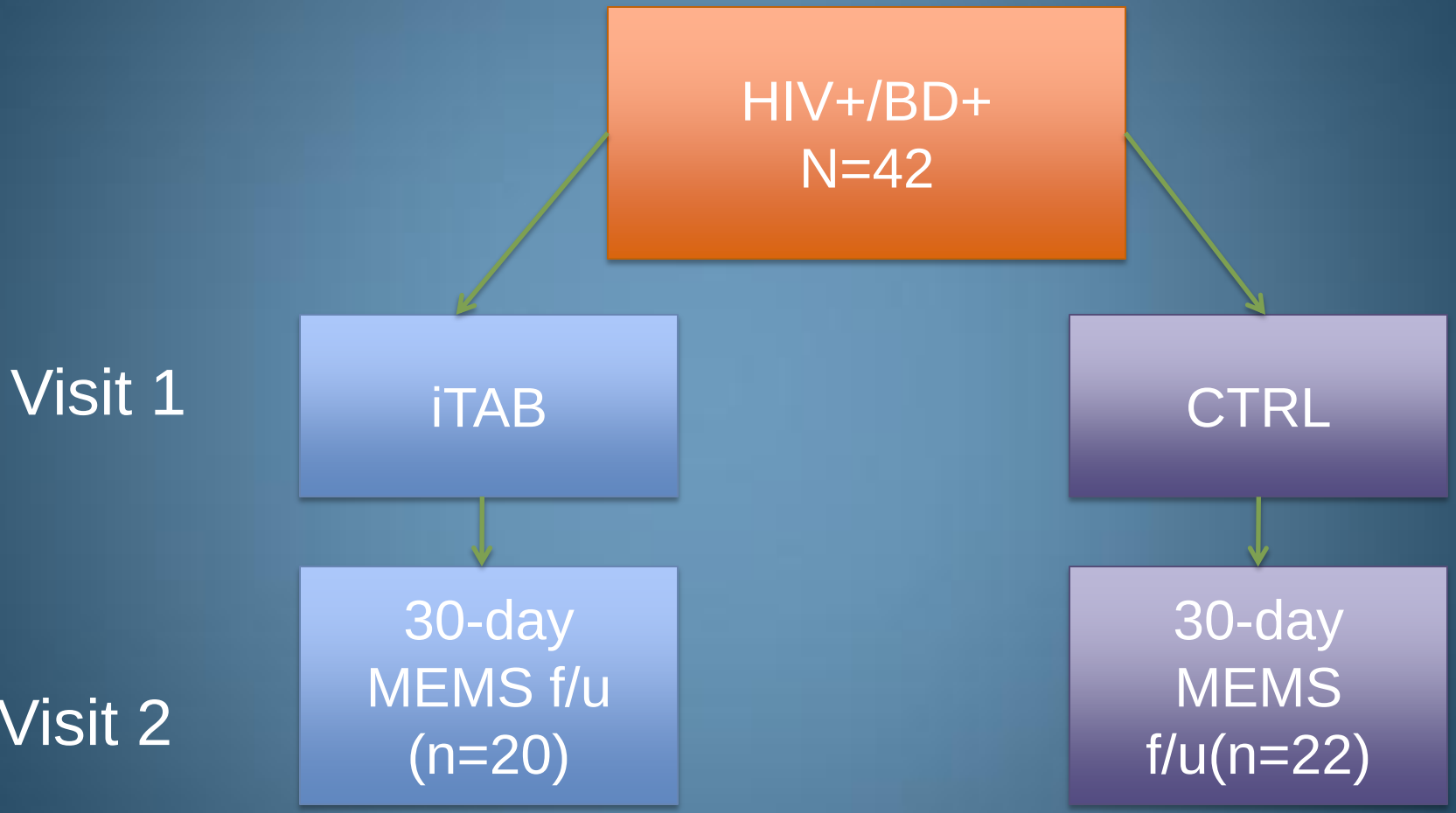

Other iTAB components:

- 3 consecutive days of non-responses get a "noncompliance" text
- 5 consecutive days of non-responses, call from RA
- Adherence Targets: "Ur current adherence: xx%. Adhr when u take ur next dose: xx% (x/x doses)"
- Personalized Reinforcer

# iTAB Inclusion Criteria

- 18 years or older at time of enrollment
- HIV-infected and on ART
- Current bipolar diagnosis as determined via diagnostic interview (i.e., CIDI) and taking a psychotropic medication to treat BD
- Willingness to receive daily text messages
- Willingness to track medication via MEMS for 30 days

# Sample to Date



# Demographics

| | CTRL (n=22) | ITAB (n=20) | P-value |
|---|---|---|---|
| Age | 46.3 (10.7) | 49.3 (9.2) | 0.38 |
| Education | 13.3 (3.1) | 13.6 (2.1) | 0.70 |
| Ethnicity (% White) | 45.5 | 70.0 | 0.11 |
| Sex (% Male) | 81.8 | 95.0 | 0.17 |
| Global Deficit Score | 0.74 (0.76) | 0.51 (0.41) | 0.49 |
| Estimated Verbal IQ | 100.3 (17.9) | 98.3 (17.0) | 0.62 |

# Psychiatric Characteristics

| | CTRL (n=22) | ITAB (n=20) | P-value |
|---|---|---|---|
| Lifetime Substance Dependence,% | 77.3 | 55.0 | 0.13 |
| Current Substance Dependence, % | 4.6 | 5.3 | 0.92 |
| Euthymic during study period, % | 68.2 | 70.0 | 0.90 |
| Beck Depression Inventory–II | 17.9 (10.8) | 14.7 (10.3) | 0.26 |
| Young Mania Rating Scale | 5.6 (4.6) | 5.8 (6.3) | 0.54 |
| GAF | 66.6 (10.9) | 69.7 (8.9) | 0.27 |

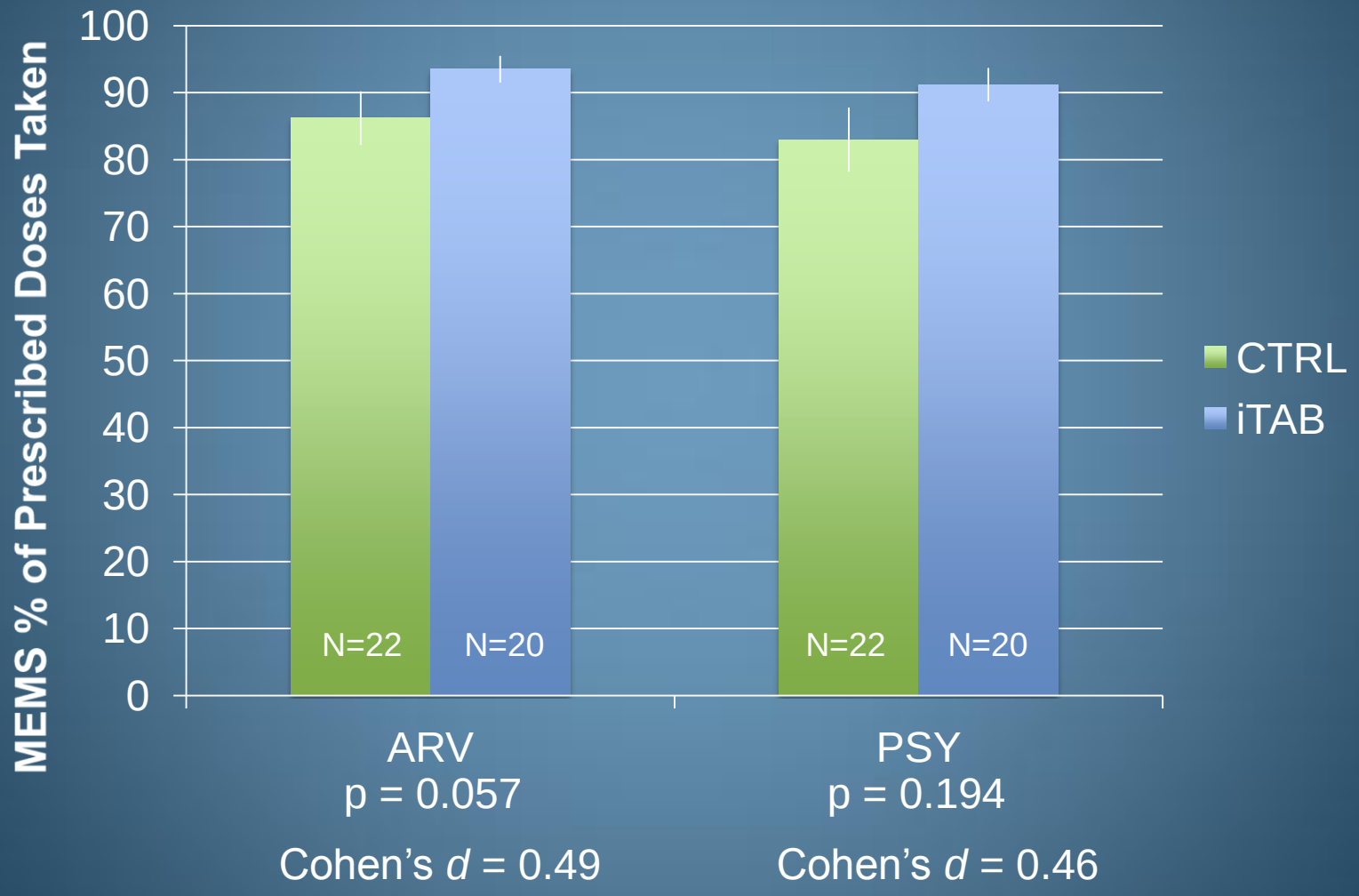
# Medical Characteristics

| | CTRL (n=22) | ITAB (n=20) | P-value |
|---|---|---|---|
| Current CD4 Count | 655.8 (324.2) | 603.4 (392.8) | 0.56 |
| Nadir CD4 Count | 225.7 (153.1) | 281.2 (258.2) | 0.73 |
| HIV RNA Detectable, % | 9.5 | 25.0 | 0.18 |
| AIDS Status, % | 63.2 | 60.0 | 0.85 |
| HCV Status, % | 31.8 | 25.0 | 0.63 |

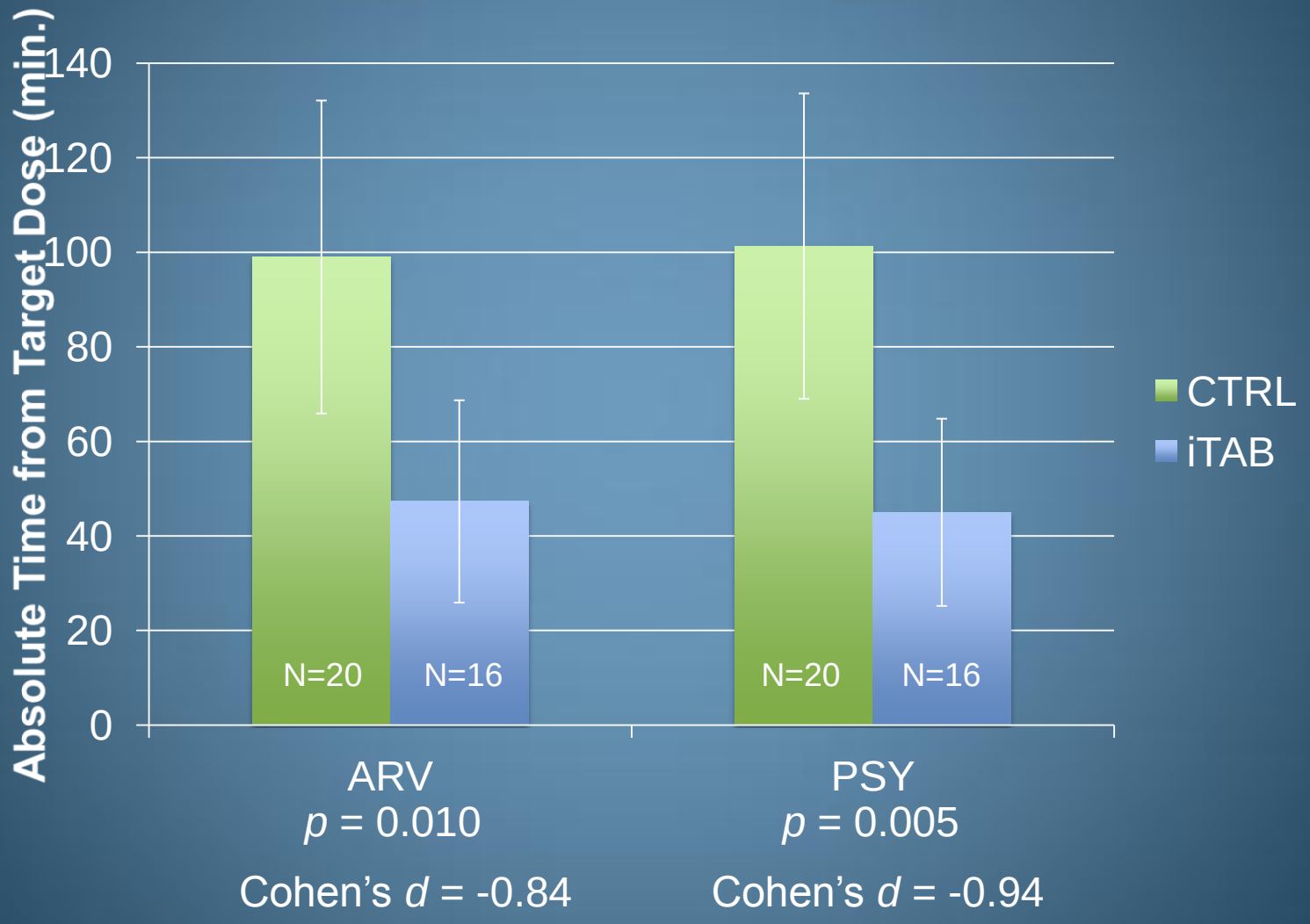
# Medication Characteristics

| | CTRL (n=22) | ITAB (n=20) | P-value |
|---|---|---|---|
| Duration ARV regimen, months | 49.2 (43.1) | 30.5 (22.3) | 0.40 |
| Total No. of pills per day, all meds | 14.7 (8.8) | 18.3 (10.8) | 0.13 |
| Once daily ARV, % | 90.9 | 85.0 | 0.55 |
| Once daily PSY, % | 86.4 | 85.0 | 0.90 |

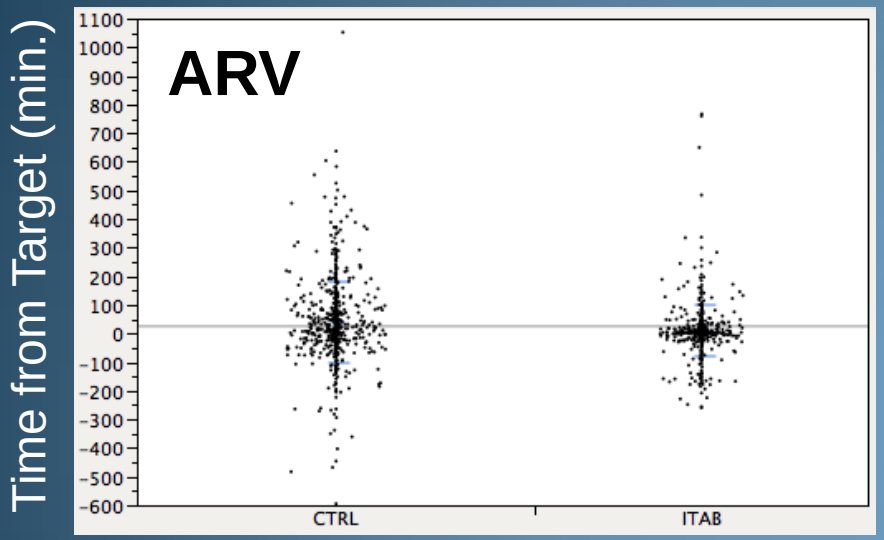
# Overall MEMS Adherence by Group



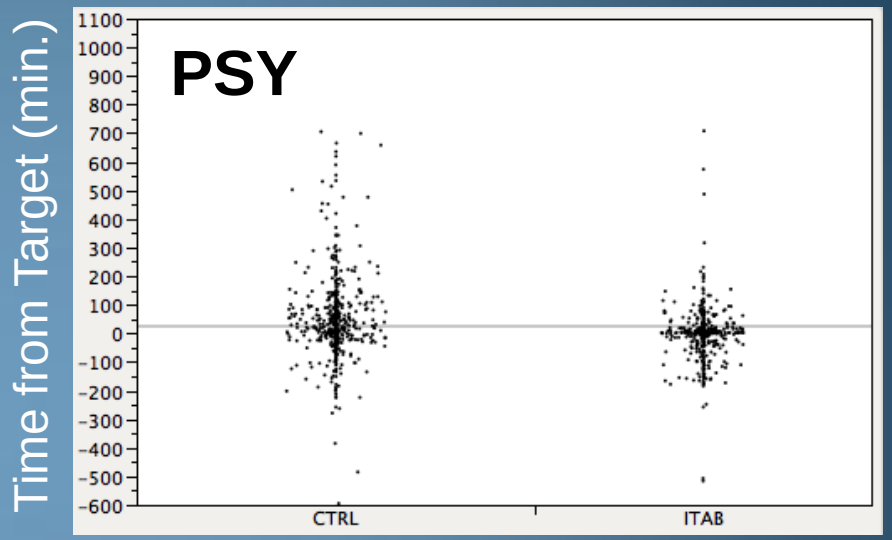
# Time from Target Dose by Group



# ARV and PSY Dose Timing



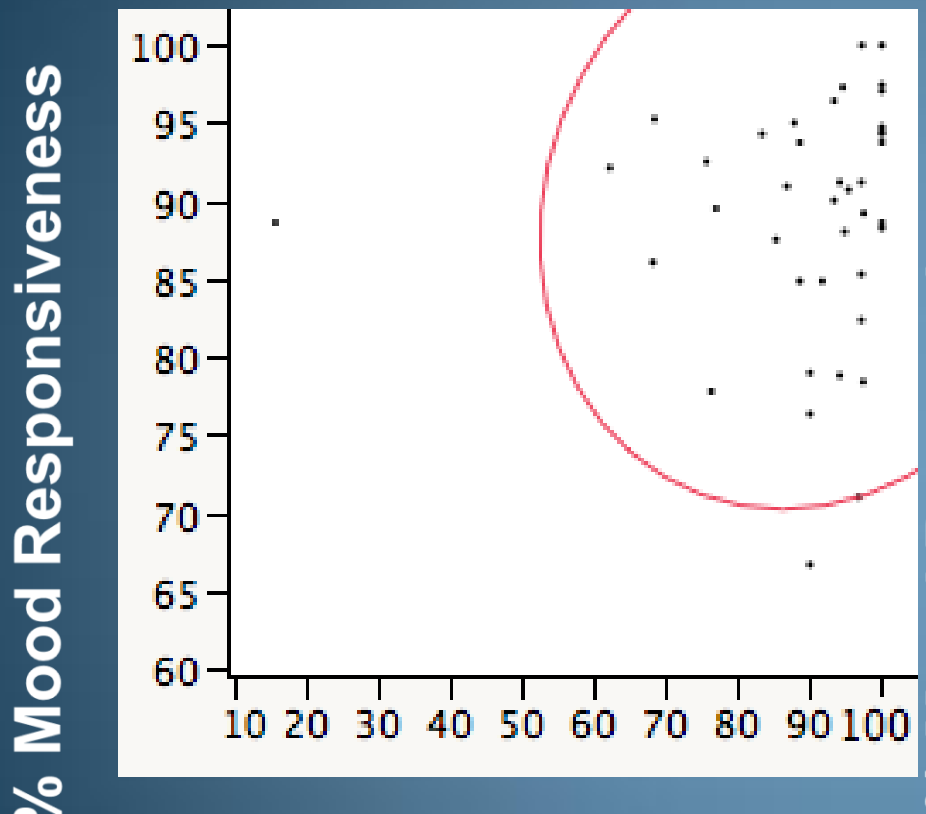

Z = -4.78, $p < 0.001$



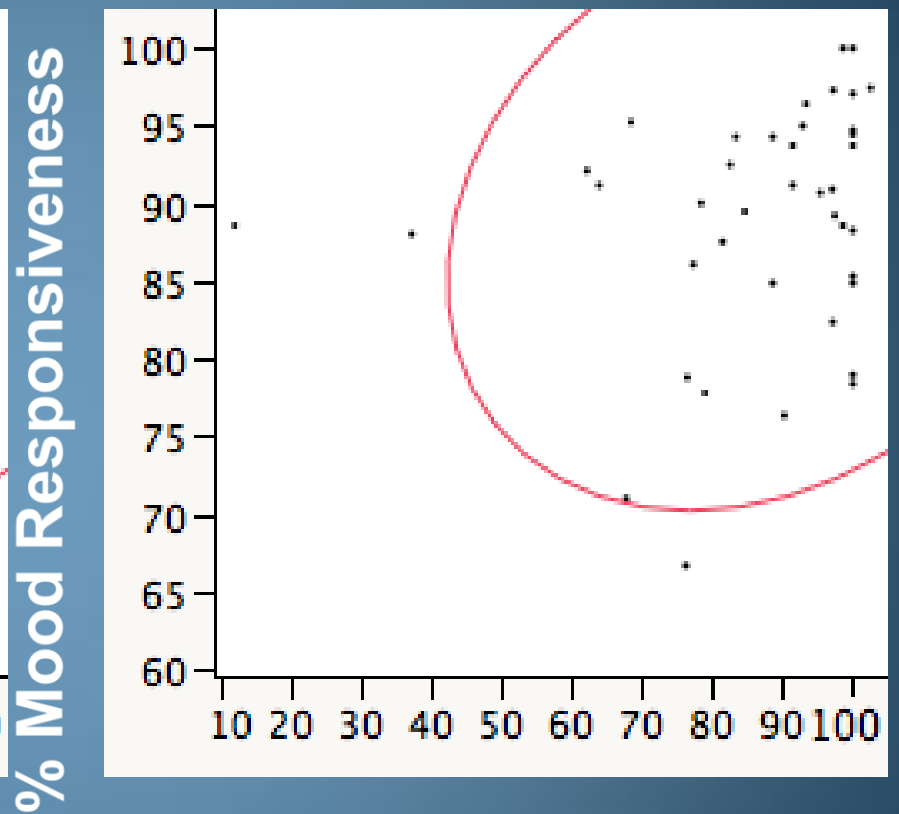

Z = -8.45, $p < 0.001$

Time of ARV and PSY dose was significantly more clustered around target time for iTAB group

# All: Mood Responsiveness & Adherence

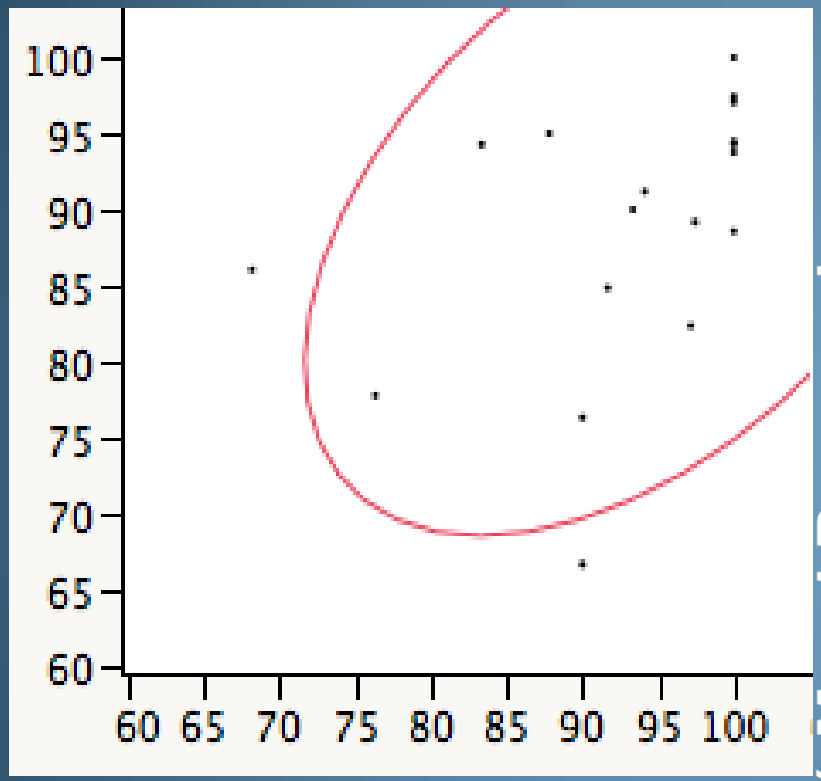



**Spearman's ρ = 0.327**
**p = 0.04**

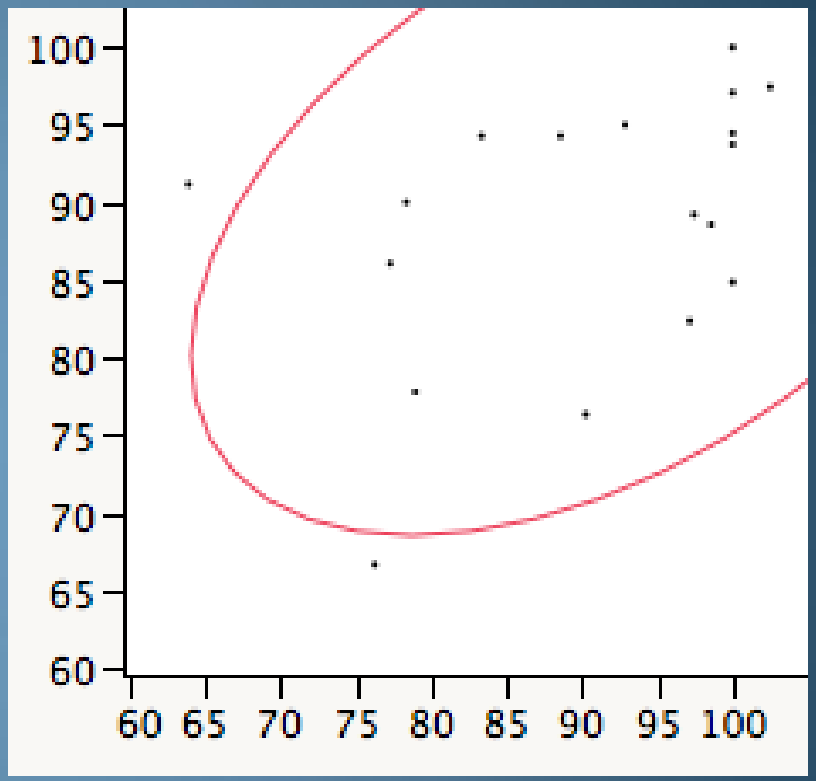



**Spearman's ρ = 0.352**
**p = 0.02**

# iTAB: Mood Responsiveness & Adherence

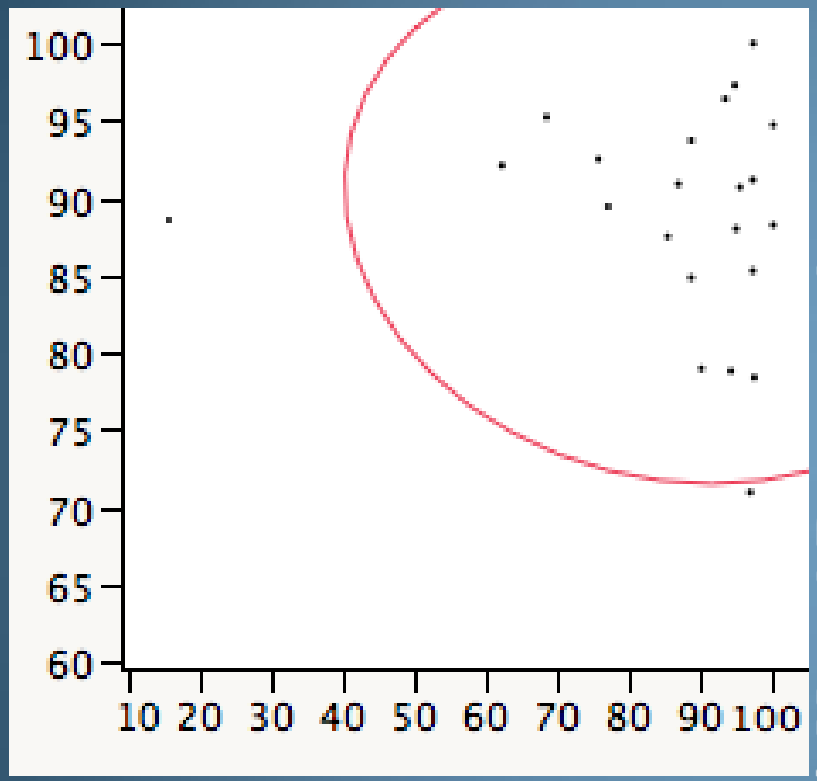



**Spearman's ρ = 0.629**
**p < 0.01**

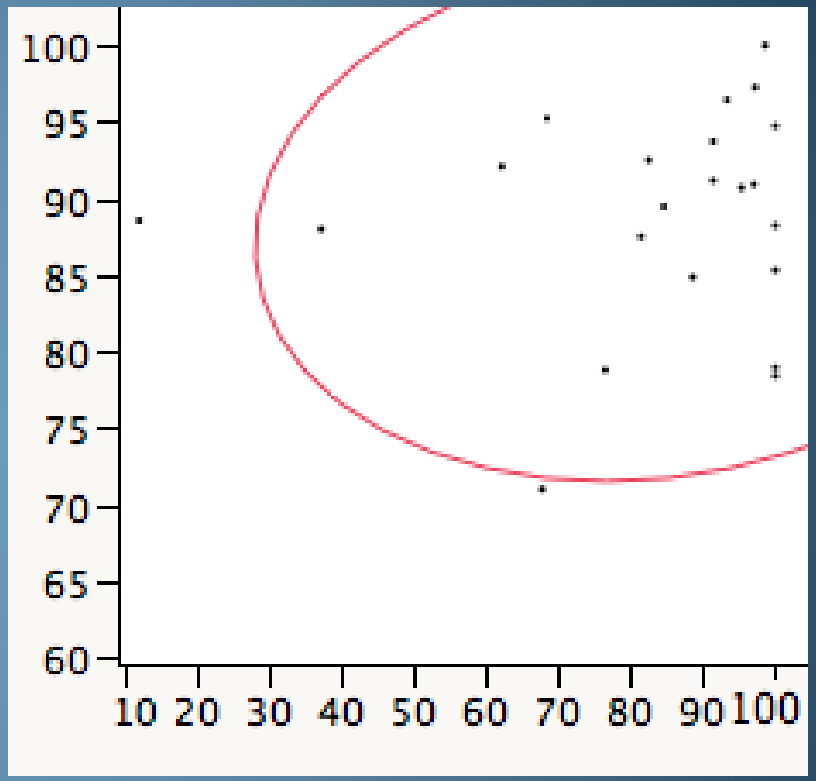



**Spearman's ρ = 0.605**
**p < 0.01**

# CTRL: Mood Responsiveness & Adherence




**Spearman's ρ = -0.122**
**p = 0.59**




**Spearman's ρ = 0.084**
**p = 0.71**

# Conclusions & Future Directions

- iTAB as compared to CTRL in difficult-to-treat HIV+/BD+:
  1. Trend toward improved ARV adherence; medium effect size
  2. Significantly better dose timing → improves therapeutic coverage
  3. Daily mood text message not associated with improved adherence in the CTRL group, arguing for the value of personalized reminders
- Future studies with iTAB will:
  1. Evaluate the utility in HIV+ active METH users
  2. Assess the intervention over longer periods of time & assess frequency of reminders
  3. Determine the utility of iTAB for PrEP

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