



University of California
San Francisco



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Hospital and Trauma Center



Fishbowls and Furosemide:

Introducing contingency management to nine patients with methamphetamine-associated cardiomyopathy in a novel addiction/cardiology co-management clinic

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Disclosures

- None of the authors have conflicts of interest or other disclosures to report

Roadmap

1) Background

2) Heart Plus Team/Clinic

3) Program Evaluation

4) Results

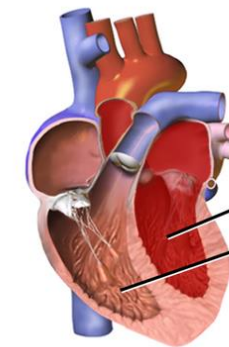
5) Discussion/Learning Points



Methamphetamine and the heart

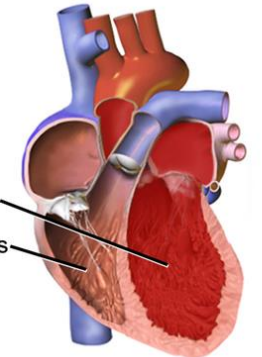
Methamphetamine effect	Cardiac outcome
	Malignant hypertension
	Coronary vasospasm
	Acute myocardial infarction
Tachycardia, hypertension	Aortic dissection
	Malignant arrhythmias
Myocardial toxicity	Methamphetamine associated cardiomyopathy
Pulmonary arterial hypertension	Right heart failure
	Dysrhythmias
Neurotransmitter depletion	Sudden cardiac arrest
Intravenous drug injection	Infectious endocarditis

Normal Heart



Chambers relax and fill, then contract and pump.

Heart with Dilated Cardiomyopathy



Muscle fibers have stretched. Heart chambers enlarge.

Treatment for methamphetamine use disorder?

Poor evidence:

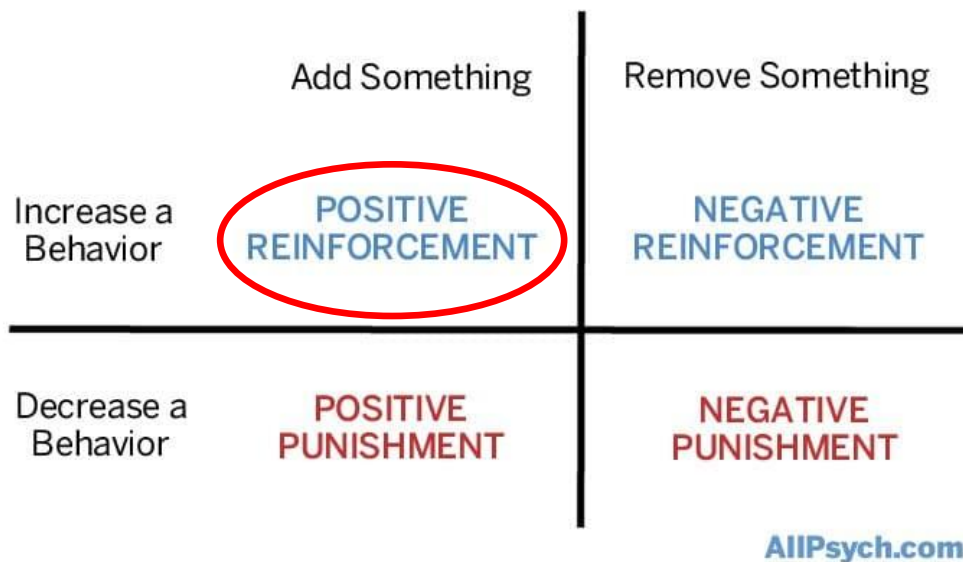
- Pharmacotherapy

Good evidence:

- **Contingency Management**
- Community Reinforcement
- Motivational Interviewing
- Cognitive Behavioral Therapy

Contingency Management = Positive Reinforcement

OPERANT CONDITIONING



Positive Reinforcement:

- Using a desirable stimulus/reward to reinforce a behavior

Behavior:

- Avoiding stimulants as evidenced by non-reactive point of care urine toxicology

Reward:

- Gift cards or vouchers

Contingency Management at the VA

Veterans Affairs Study 2011 – 2015

- “Fishbowl” variable magnitude of reinforcement model
- 12 wk program, POC UDS x2/wk
- (-) urine → draws from the fishbowl
- # of draws increase with consecutive (-) urines
- 55.9% attendance
- 91.9% of 27,850 urine tests were negative



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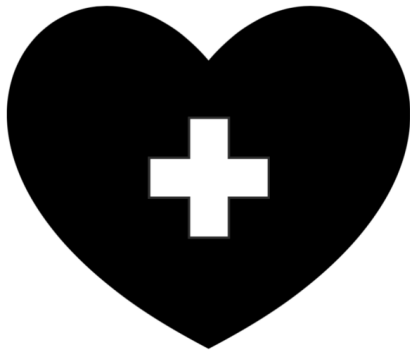
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Heart Plus

Soraya Azari



Marlene Martin



Albert Liu



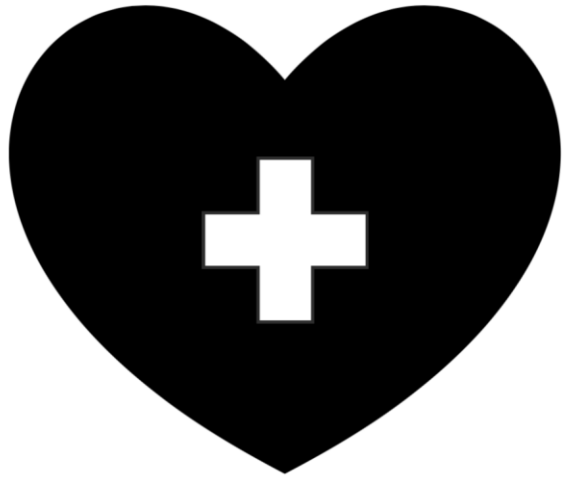
Jonathan Davis



Leslie Suen

Aims

1. Increase engagement in heart failure clinic
2. Increase access to evidence-based treatment for methamphetamine use disorder
3. Help interested patients decrease or discontinue methamphetamine use
4. Promote teamwork and collaboration across specialties



Heart Plus Clinic

12-week pilot addiction/cardiology co-management clinic
with contingency management for patients with
methamphetamine associated cardiomyopathy

Patient Criteria

- **Inclusion Criteria**

- Stimulant use disorder
- Heart failure with reduced ejection fraction
- Hospitalization for heart failure exacerbation in the last year
- Interested in decreasing or stopping stimulant use

- **Exclusion Criteria**

- In a residential treatment program

Patient Recruitment

- Inpatient Addiction Care Team
- Inpatient Cardiology Service
- Inpatient Family & Internal Medicine Services
- Heart Failure Clinic
- Primary Care Clinic

Visit #1 – Protocol

1. Warm welcome
2. Meet addiction and cardiology providers
3. Describe Heart Plus program
4. Priming Draw: draw from the fishbowl as many times as it takes to win one gift card
5. If interested, informed consent



What's in the bowl?

500 Sticky Notes

- 50% = affirmation, no gift card
 - “Good Job”
 - “Way to go!”
- 41.8% = \$5 gift card
- 8% = \$20 gift card
- 0.2% = \$100 gift card

Visits #2-24 – Protocol

1. Point of care urine toxicology on arrival
2. Meet with addiction provider (10-20 minutes)
 - *Check-in about substance use*
 - *Contingency management*
 - *See cardiologist as needed*
3. Full cardiology appointment (q3-4 weeks)
4. Give reminder slip for next visit (pictured)



Next appointment: _____

You will earn ____ draw(s) for a
negative urine test

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12-week Contingency Management Schedule/Cost

SCHEDULE:

- 1st visit: One priming draw
- 2nd visit: 1 attendance draw + 1 draw for neg Utox
- 3rd visit: 1 attendance draw + 2 draws for neg Utox
- 4th visit: 1 attendance draw + 3 draws for neg Utox
- Etcetera

RULES:

- Max out at 8 draws
- # of draws reset if urine is “not negative” or if missed appt

COST PER DRAW:

- 1st clinic priming draw = \$7.78 per draw
- Subsequent draws = \$3.89 per draw

How much does this 12-wk program cost?

Perfect attendance, Utox all negative	\$615/patient (on average)
50% attendance	\$307/patient (on average)
10 patient pilot assuming 50% attendance	\$3070 in gift cards



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Pilot Evaluation: RE-AIM Framework

RE-AIM – a commonly used implementation science framework for planning and implementing new programs and defining outcomes, measurements, and data collection

Reach

Effectiveness

Adoption

Implementation

Maintenance



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Results – Recruitment (Jan/Feb 2020)

19 patients were referred

- 2 from PCP, 3 from cardiology clinic, 14 through inpatient Addiction Consult Team

9 patients were enrolled

- Majority of non-enrolled patients were lost to f/u

Heart Plus: Patient Characteristics

Age	Median 43 years (IQR 13 years)
Gender	8/9 (89%) male; 1/9 (11%) female
Race/Ethnicity	2 Asian/PI, 2 Black, 4 White
Housing Status	6/9 (67%) unhoused or marginally housed

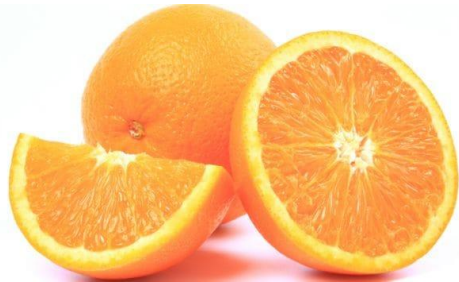
Heart Plus: Patient Characteristics

Substance Use	6/9 (67%) had >1 substance use d/o
# of ED/Hospital visits in the last year	Median 5 visits (IQR 3)
ACC/AHA Heart Failure Severity	All were C-D
Ejection Fraction	Median 21% (IQR 9%)

Heart Plus – Previous Engagement

Referred to heart failure clinic in the past?	8/9 (89%) had been previously referred
Engaged with cardiology clinic in the past?	Only 2 of those referred attended any visits
Cardiology attendance rate	45% of visits attended

3/2/20 = First Day of Heart Plus Clinic!!!



Results – Heart Plus Clinic 1st Visit

- 7 out of 9 (78%) of patients came to Heart Plus!
- 2 ED visits prevented
 - 1 for HF exacerbation
 - 1 for gout flare



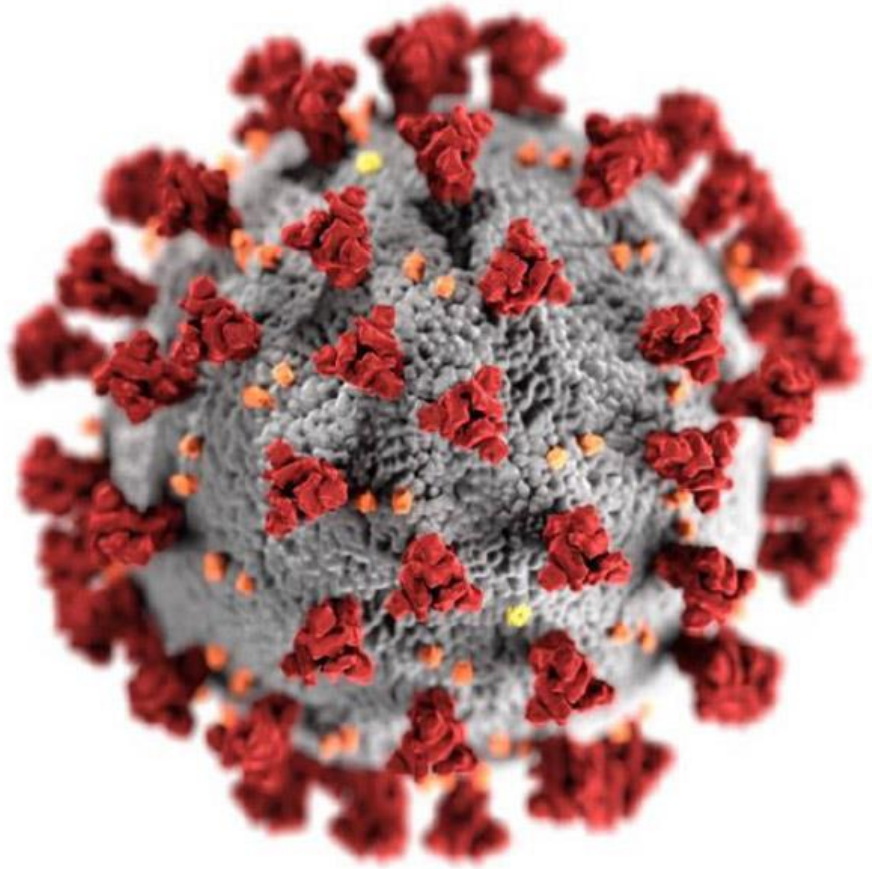
Results – Heart Plus Clinic 2nd Visit

- 6/7 patients came to second visit!*
- All urine toxicology was negative for stimulants
- Average fishbowl bowl prize: \$7 (range \$0-\$20)

*The one patient who came to the first visit but didn't come to the second visit had a disabling gout flare. He called ahead of the appointment time to cancel.



Results – Heart Plus Clinic 3rd Visit



**Initial Finding: Heart Plus is associated
with increased engagement!**

Pre Heart + Attendance: 45%

Heart + Initial Attendance: 78%

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Discussion/Lessons Learned

Conclusions

- Patients showed high levels of (initial) engagement
- Staff/providers showed high levels of support/interest

Lessons Learned

- Getting POC Utox approved by the lab is more difficult than expected
- Working across specialties is fun!
- Taking a strength-based, positive approach is appreciated by patients



Thank You!

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