

A Behavioral Model for Maintenance of Drug Abstinence

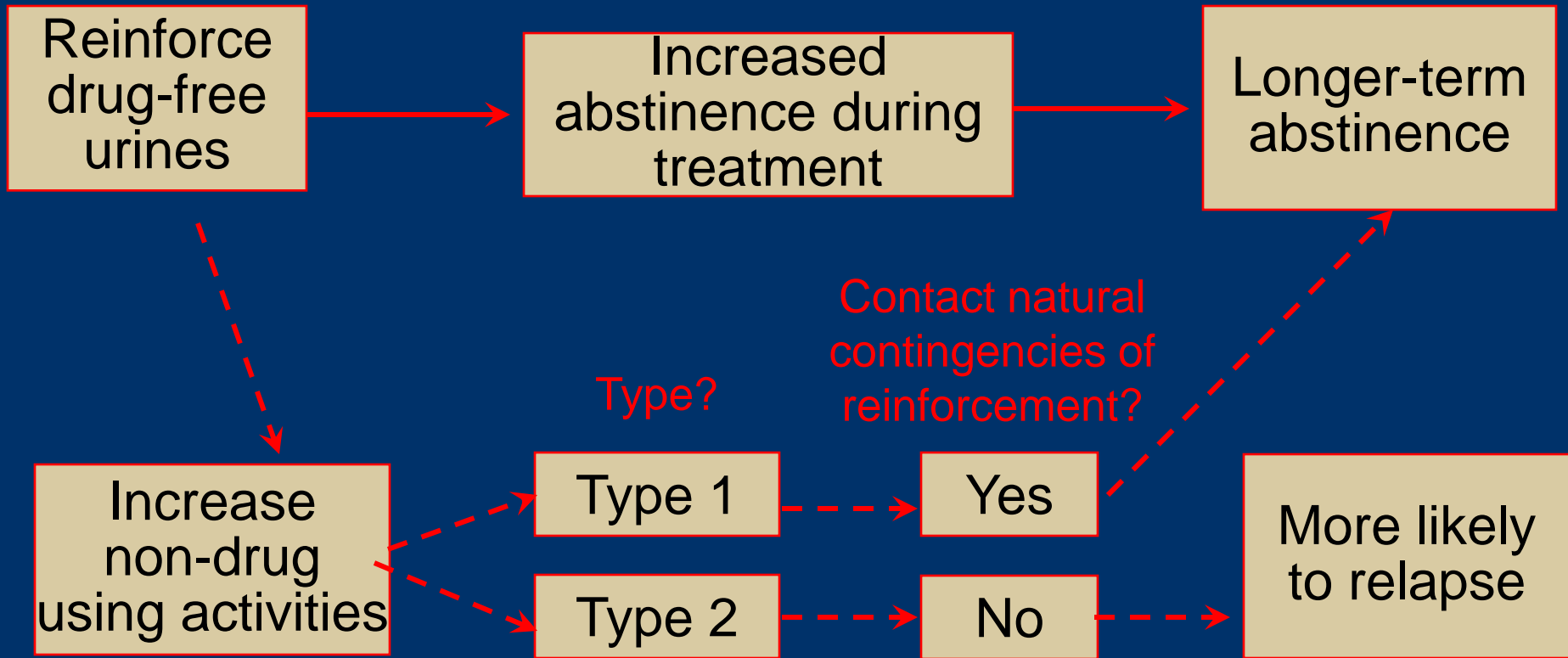
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Theoretical Approach

- Drug abuse is sensitive to environmental consequences
- Drug self-administration is sustained by environmental consequences
- Providing reinforcers for other behaviors can shift responding from drug to other behavior

Logic Model



Purpose

1. To determine if a longer duration of Voucher-Based Reinforcement Therapy (VBRT) will result in increased abstinence during the first year after treatment entry
2. To determine if longer durations of abstinence during VBRT will predict better long-term abstinence outcomes following VBRT
3. Does providing a longer duration of VBRT result in greater frequency of non-drug using activities?

Clinic & Recruitment

- Research office set in a methadone maintenance clinic serving 1000 opiate dependent patients
- Patients primary drug of abuse is heroin
 - Many also have secondary cocaine, benzodiazepine, or other drug use
- Participants referred based on counselor recommendation
 - Must have recent cocaine use
 - Must be cocaine dependent
 - Must be receiving stable methadone dose of at least 40mg at study intake



Participants

- 130 Participants randomly assigned to Standard 12-week VBRT or Extended 36-week VBRT
- No significant differences on any baseline characteristic

	Standard (N=62)	Extended (N=68)
Mean Age (SD)	41 (10.6)	44 (10.4)
Male	68%	61%
Black	65%	60%
White	34%	32%
Hispanic	2%	6%
Employed	15%	10%
Mean Days of Cocaine Use in 30 Days Prior to Intake (SD)	16 (9.6)	17 (9.4)

General Methods

- All participants provide a urine specimen at intake
- Samples temperature tested and checked for adulteration
- Valid samples undergo urinalysis testing



Measures

Measure	Time points		
	Weekly	Bi-monthly	Quarterly
Urinalysis	X	X	X
Pleasant Events Scale			X

- Maintenance = longest duration of continuous cocaine abstinence (LDA) based on weekly urine specimens
- Abstinence also examined as percent of participants with cocaine-negative specimens at bimonthly assessments


VBRT Escalating Schedule

- Cocaine-free specimens → Voucher
- First cocaine-free specimen → \$2.50
- Next consecutive specimen → \$3.75 (+ \$1.25)
- Next consecutive specimen → \$5.00 + bonus = \$15
- \$10.00 bonus for every 3 consecutive cocaine-free samples

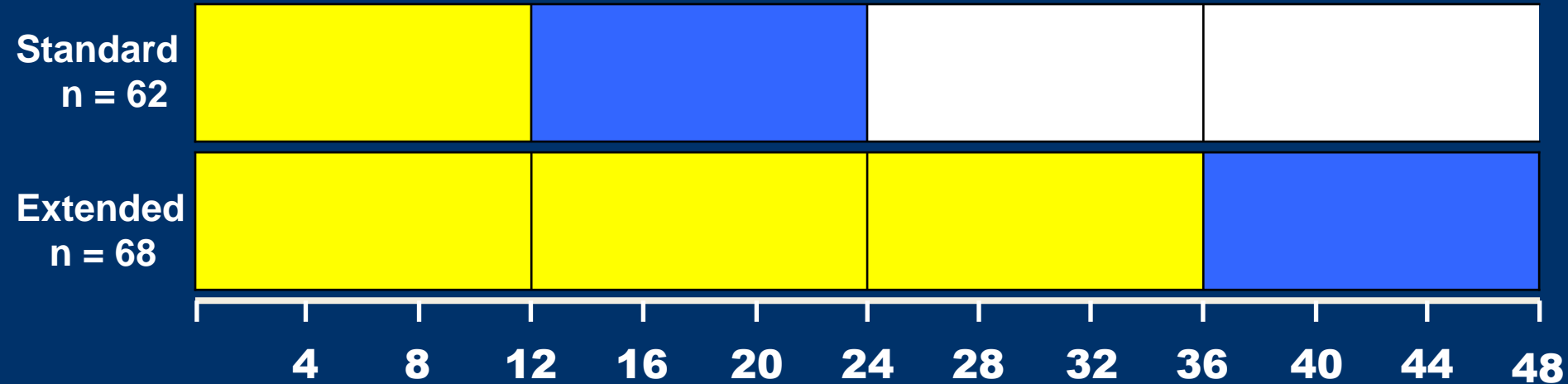
VBRT Escalating Schedule

- Vouchers could escalate to a maximum of \$40.00
- Cocaine-positive or fail to provide specimen → \$0 and reset next voucher to \$2.50
- 5 consecutive cocaine-negative samples → the voucher value is restored to the highest previous value

Aftercare or After Treatment Phase

- Participants provided urine samples 2x per week
- Cocaine-negative urine samples  \$1 lottery ticket


Intervention Phases



Study Phases:

 Escalating
Schedule
(ES Phase)
Vouchers

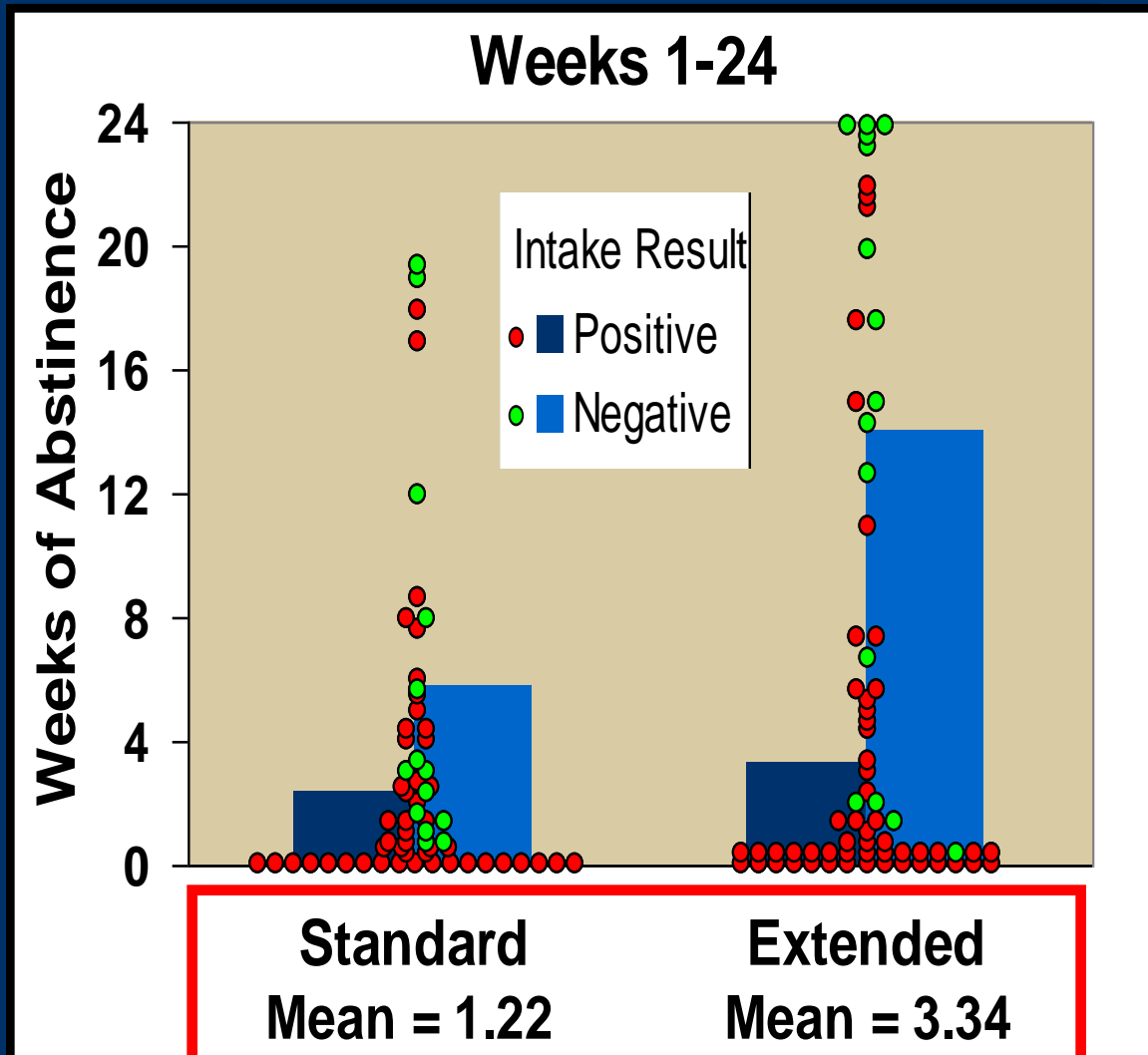
 Aftercare
Treatment
(AT Phase)
\$ 1 State Lottery
Ticket

 Extinction
(Ext Phase)
Urinalysis
feedback

Purpose of Study

1. To determine if a longer duration of VBRT will result in increased abstinence during the first year after treatment entry

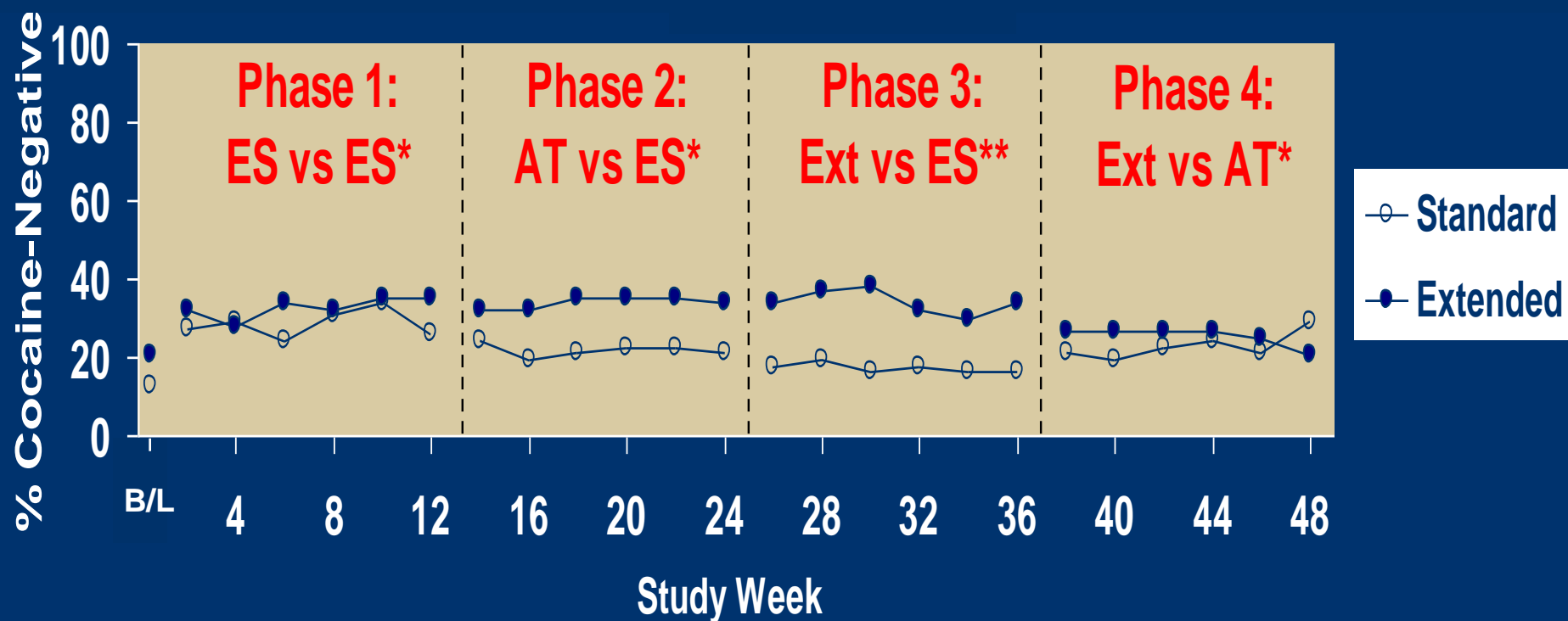
LDA by Condition & Intake Urinalysis Result



- Participants in the Extended condition had longer periods of abstinence ($p=0.017$)
- Participants cocaine-negative at intake also had longer periods of abstinence ($p<0.001$)

Abstinence During First Year

Generalized Estimating Equations (GEE) of Condition on Cocaine Urinalysis Results for each of the 4 study phases



* Non-significant

** OR = 2.52, $\chi^2 = 4.88$, $p = 0.03$

Purpose of Study

2. To determine if longer durations of abstinence during VBRT will predict better long-term abstinence outcomes following VBRT

Abstinence During Months 9 - 12

- Generalized Estimating Equations (GEE) of Maximum Weeks of Continuous Abstinence During 1-6 Mo and Treatment Condition on Cocaine Urinalysis Results During Mo 9-12

	OR	χ^2	P-value
Max Continuous Abstinence, Mo 1-6	1.09	12.03	<0.001
Extended (vs. Standard)	0.89	0.15	0.70

Purpose of Study

3. Does providing a longer duration of VBRT result in greater frequency of non-drug using activities?

Frequency of Drug-free Activities

Preliminary analyses of PES data over the first year indicate no significant differences as a function of duration of VBRT

Conclusion

1. Longer duration of VBRT results in increased durations of abstinence during the first year after treatment entry
2. Longer durations of abstinence during VBRT predicts better long-term abstinence outcomes following VBRT
3. Providing a longer duration of VBRT may not result in greater frequency of non-drug using activities

Additional Conclusions

- Longer duration VBRT produced increased cocaine-abstinence during VBRT, but these effects were not maintained post-treatment.
- Independent of treatment condition, participants that were able to achieve longer durations of abstinence during VBRT were more likely to be abstinent following VBRT.
- Most participants did not respond to VBRT with extended periods of abstinence, suggesting initiating behavior change is still a significant problem in drug addiction

Future Analyses

- We did not find significant differences in non-drug activities by condition, perhaps due to the low overall rates of abstinence.
- Additional analyses will examine
 - LDA as a predictor of non-drug activities
 - Condition and LDA as predictors of PES cross-products (frequency and pleasurable → reinforcement)

Future Maintenance Research

- Improved measure of alternate activities and degree of pleasurable (reinforcement) of those activities
- More focus on individuals who have some abstinence history
 - Recruit individuals who have negative cocaine at intake
 - Recruit individuals who have had a sustained period of abstinence