

# Main Findings from the Cannabis Youth Treatment (CYT) Multi-site Experiment

**Michael Dennis, Ph.D.**  
Chestnut Health Systems,  
Bloomington, IL USA

*Presentation at “Adolescent Substance Abuse: Innovative Approaches to Prevention and Treatment”, March 17-20, 2002, Banff, Alberta, Canada. This presentation was supported by funds and data from the Center for Substance Abuse Treatment (CSAT’s) Persistent Effects of Treatment Study (PETS, Contract No. 270-97-7011) and the Cannabis Youth Treatment (CYT) Cooperative Agreement (Grant Nos. T111317, T111320, T111321, T111323, and T111324). The opinions are those of the author and steering committee and do not reflect official positions of the government.*



**CYT**  
Cannabis Youth Treatment  
Preliminary Report



U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES  
Substance Abuse and Mental Health Services Administration  
Center for Substance Abuse Treatment  
[www.samhsa.gov](http://www.samhsa.gov)

# Goals of this Presentation

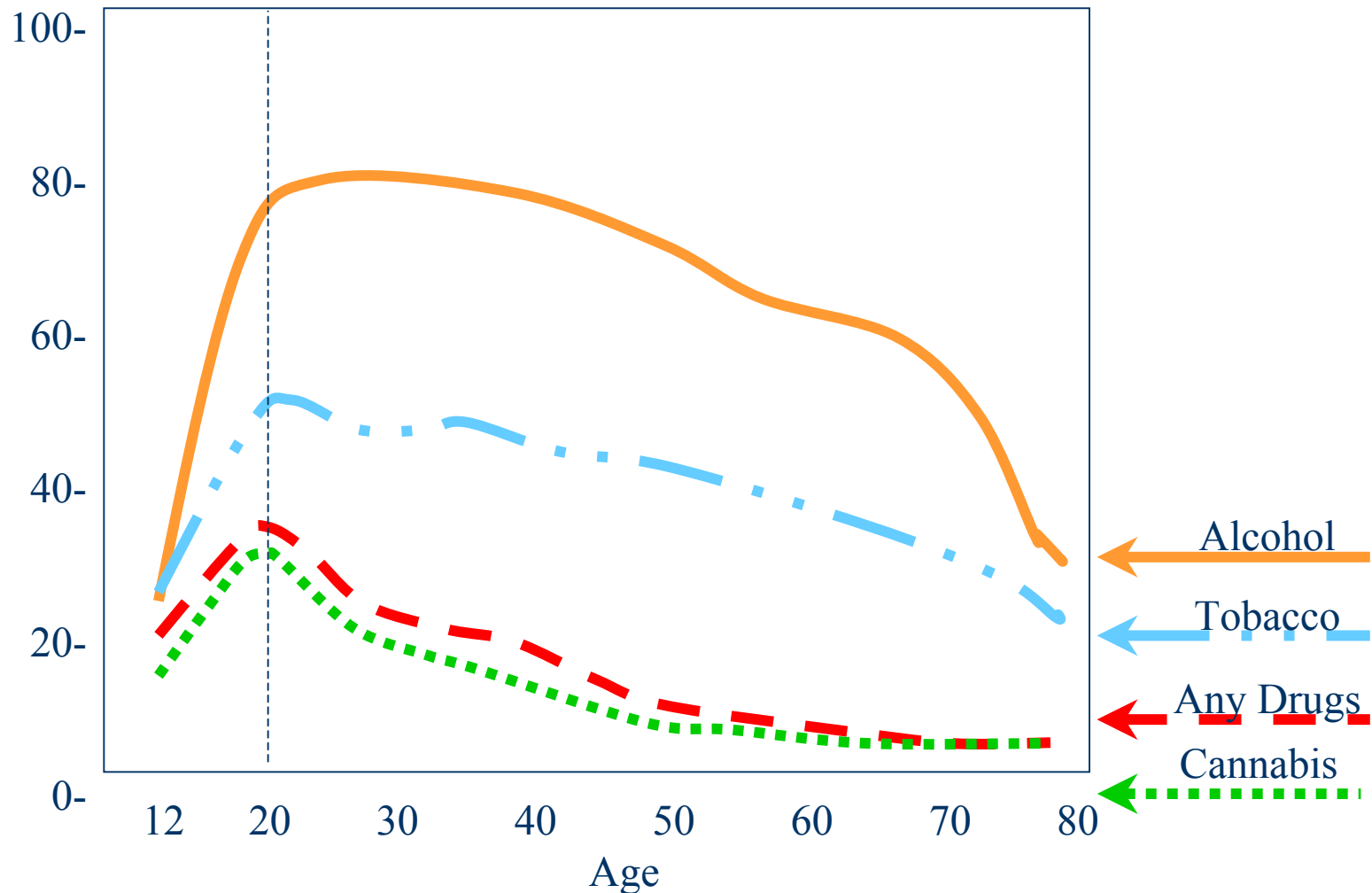
---

- Briefly review the context and state of the art of adolescent substance abuse treatment and research
- Outline the design of the CYT experiment
- Examine characteristics, patterns of use, dependence and co-occurring problems of adolescents presenting for treatment
- Present the preliminary findings on treatment and outcomes
- Examine the need to go beyond acute episodes of care to a recovery management model

# Part 1. The Context and the State of Adolescent Treatment and Research

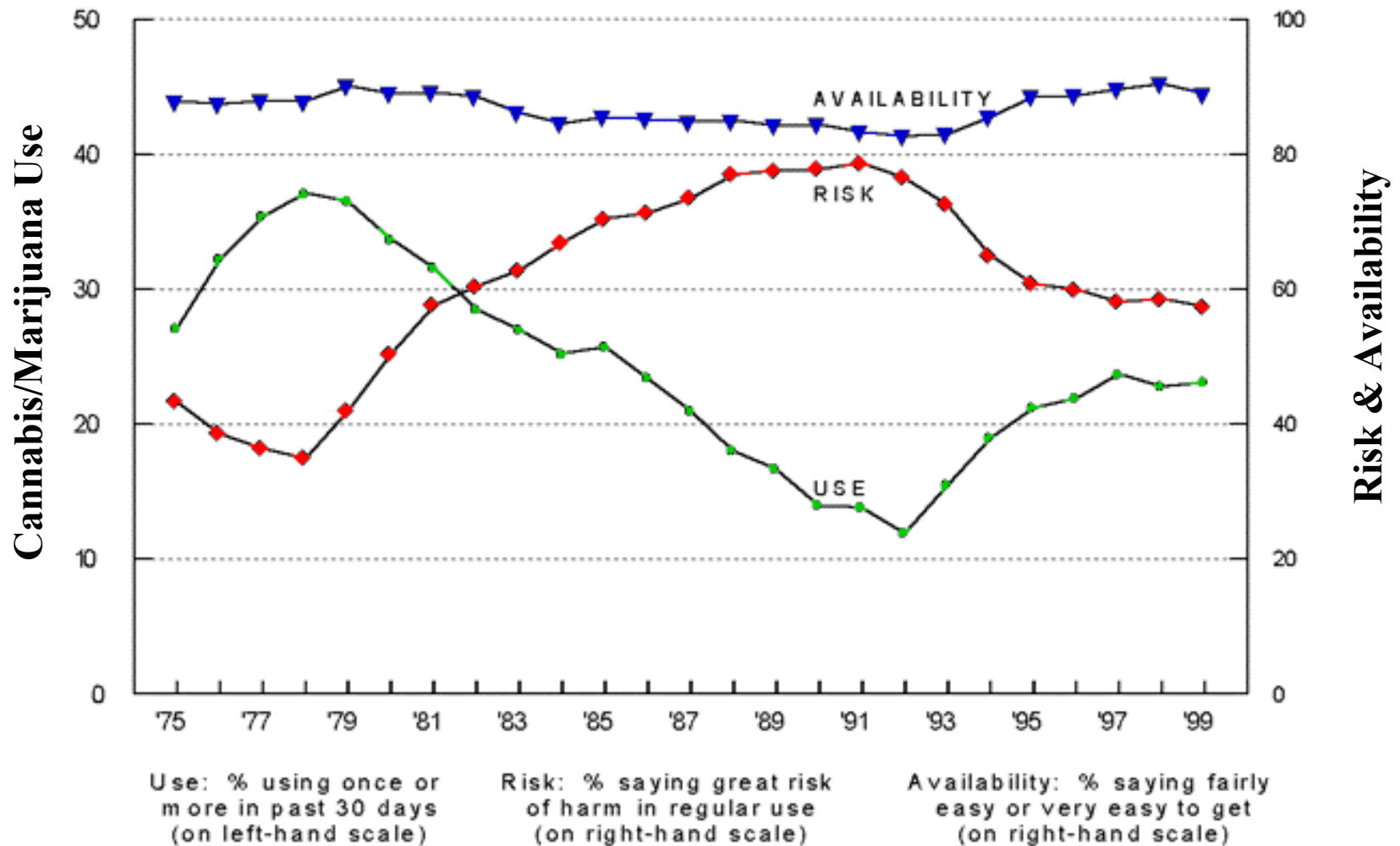


# Primary Onset of Substance Use Occurs Between the Ages 12 to 20



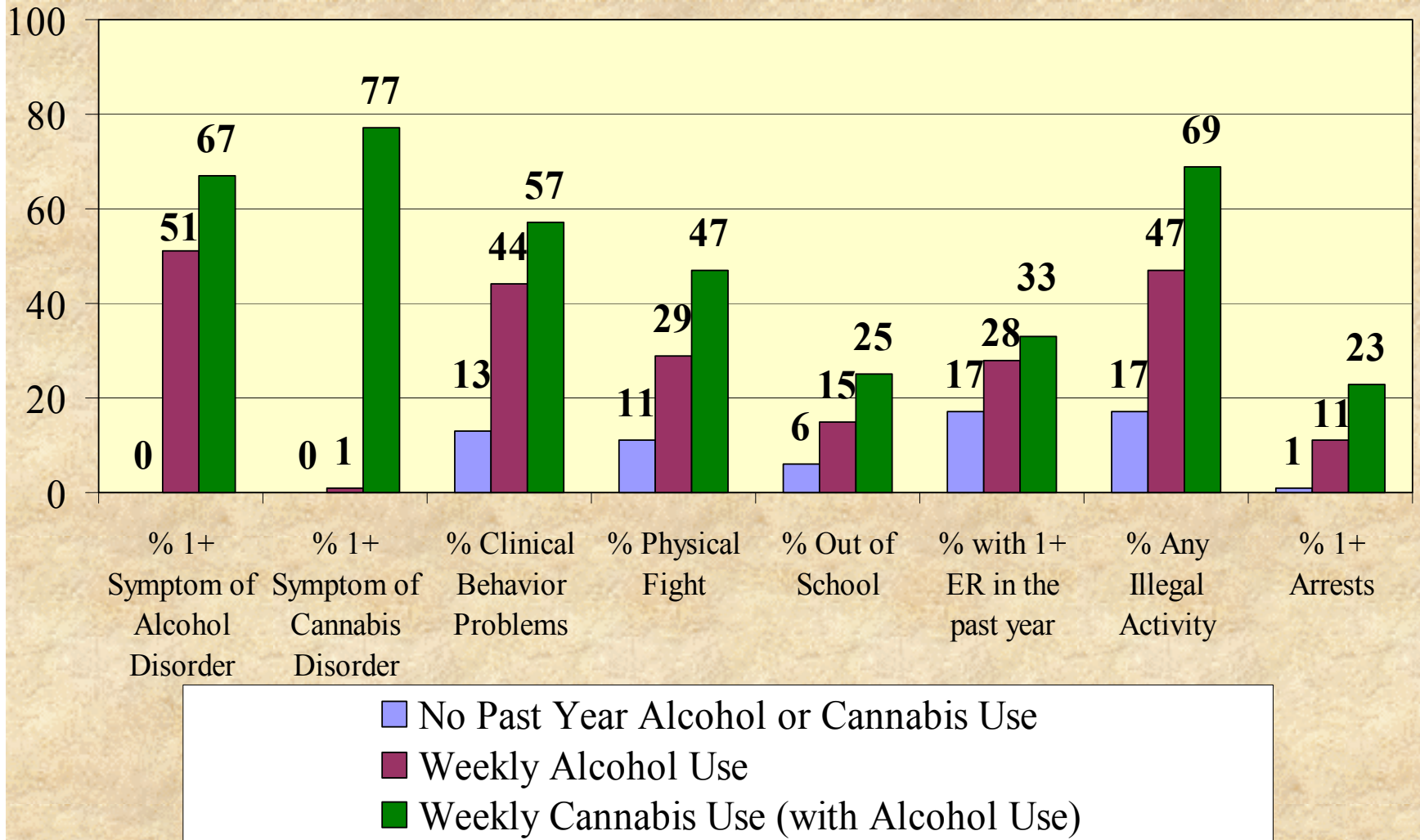
Source: Anthony, J.C., & Arria, A.M. (1999). Epidemiology of substance abuse in adulthood. In P.J. Ott, R.E. Tarter, & R.T. Amerman (Eds). Sourcebook on substance abuse. Etiology, epidemiology, assessment and treatment. Boston, MA: Allyn and Bacon.

# Importance of Perceived Risk



Source: Office of Applied Studies (2000) 1998 NHSDA

# Consequences of Substance Use



Source: Dennis, M.L., Godley, S.H., & Titus, J.C. (1999, Fall).

# Adolescent Cannabis Problems

---

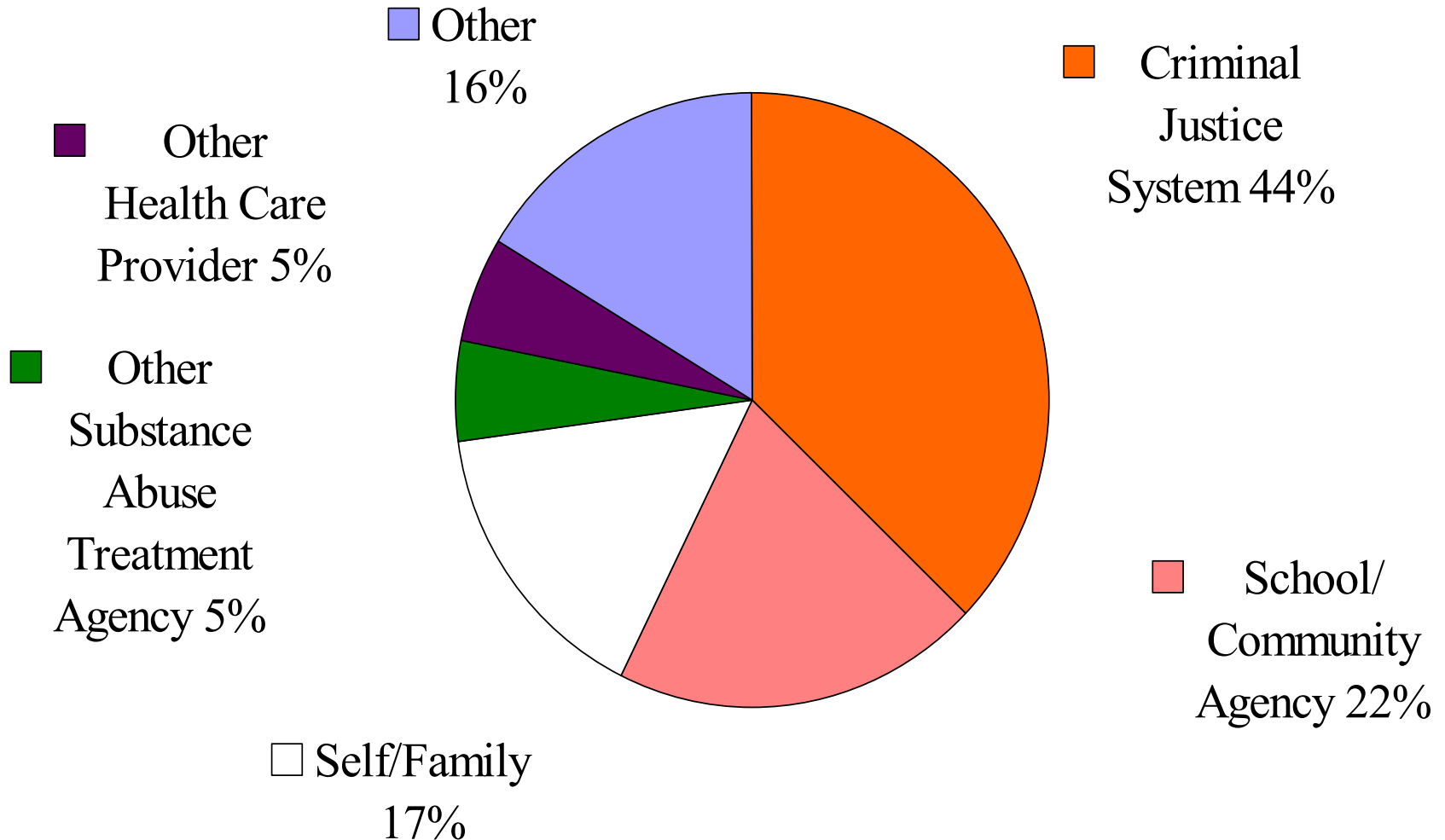
- The combination of cannabis and alcohol appears to be synergistic and leads to much higher rates of problems than would be expected from either alone.
- Combined cannabis and alcohol users are 4 to 47 times more likely than non-users to have a wide range of dependence, behavioral, school, health and legal problems.
- From 1980 to 1997, the potency of cannabis in federal drug seizures increased three fold.
- Cannabis is now the leading substance mentioned in adolescent arrests, emergency room admissions, and autopsies.

# Adolescents Presenting for Treatment

---

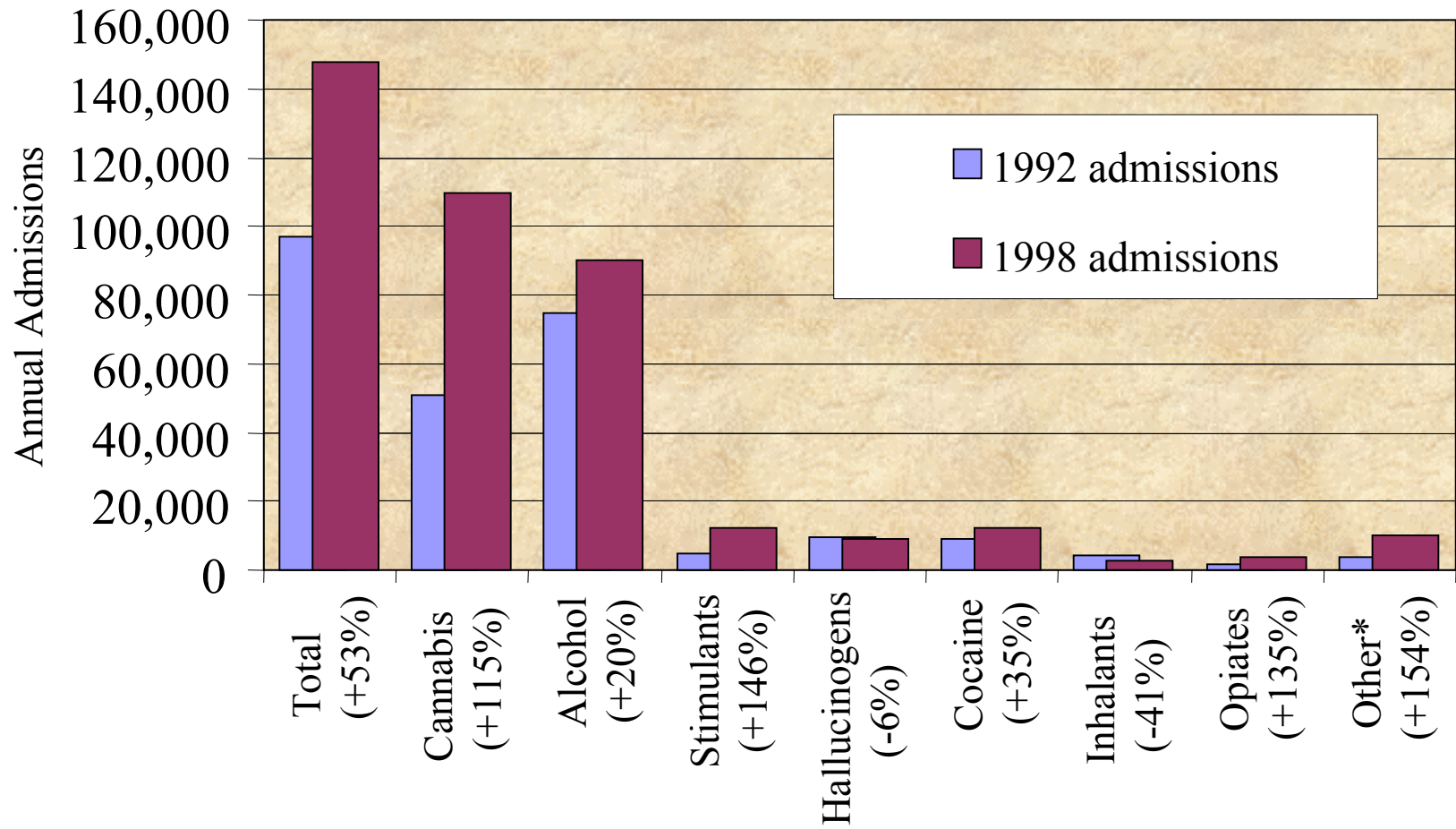
- Less than 1/10th of adolescents with substance dependence problems have received any kind of substance abuse treatment.
- While research suggests outpatient treatment should last at least 3 months, DATOS-A found that only 25% make it that far, and that the median length of stay was only 6 weeks.
- From 1992 to 1998 the number of adolescents entering publicly-funded treatment has increased from 96,787 to 147,899 (53%).
- During the same time, the number of adolescents presenting for treatment of cannabis use disorders increased from 51,081 to 109,875 (115%).

# Sources of Adolescent Referrals



Source: OAS (2000) 1998 Treatment Episode Data Set (TEDS)

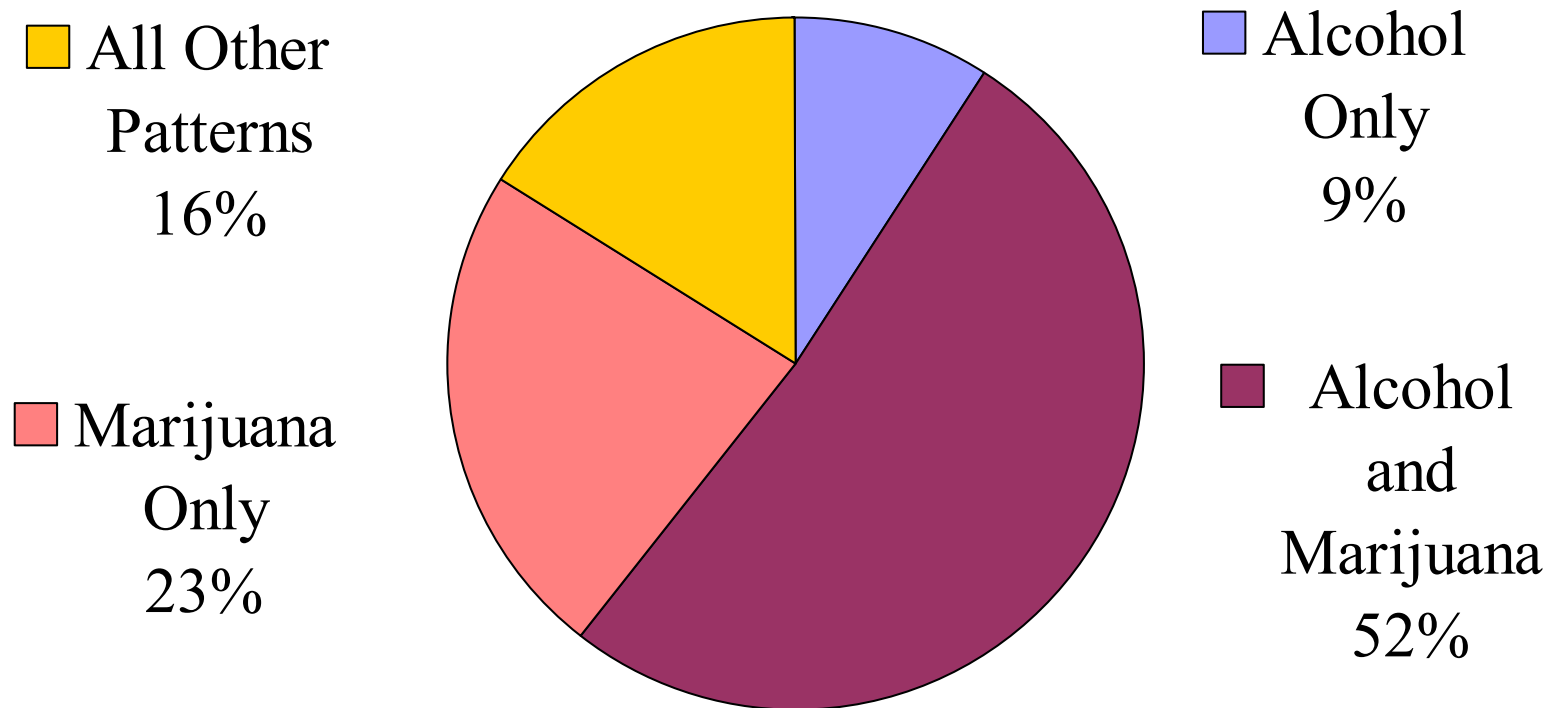
# Change in Adolescent Admissions (1992-1998)



\* including tranquilizers, sedatives and o-t-c

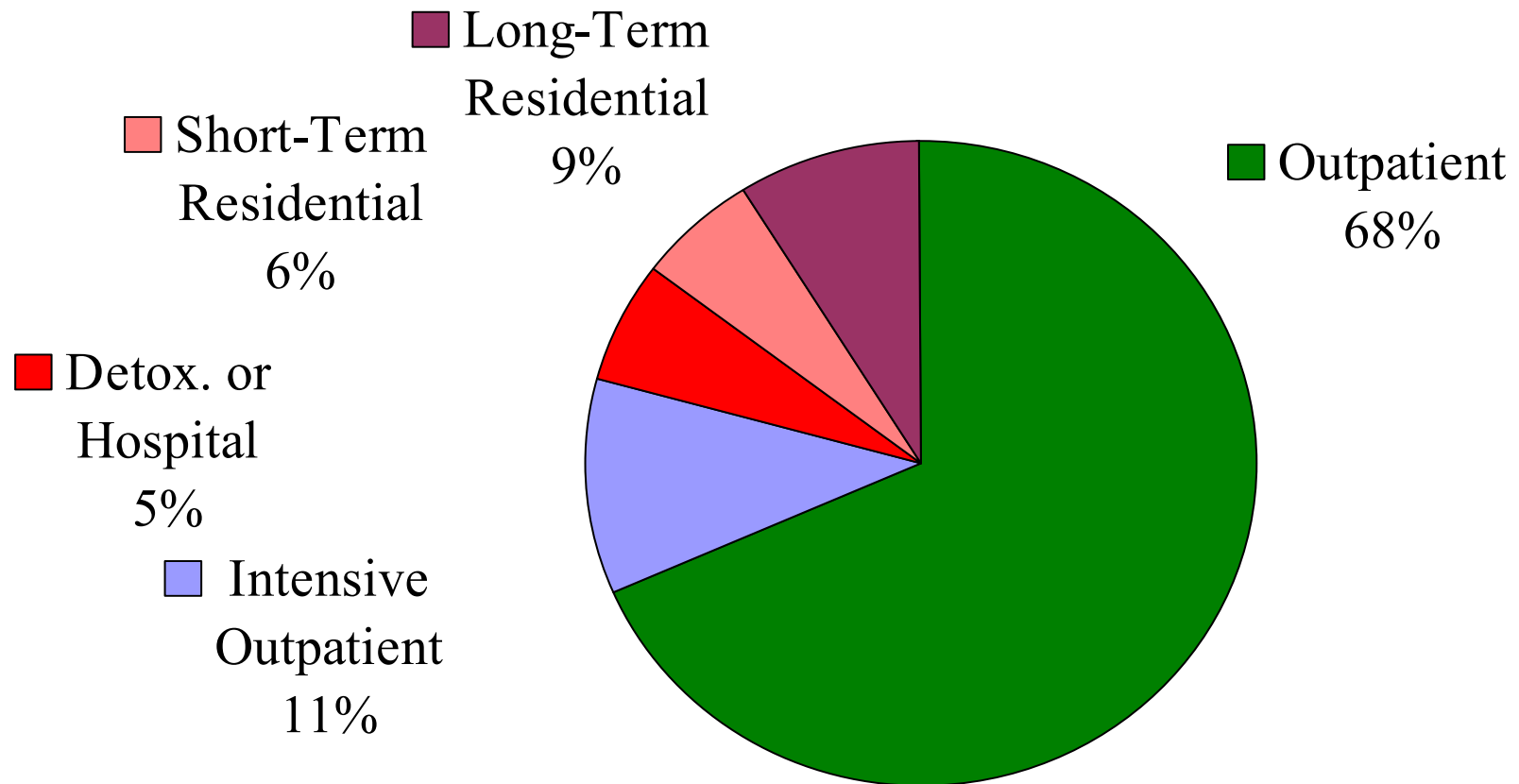
Source: OAS (2000) 1998 Treatment Episode Data Set (TEDS)

# Dominant Patterns of Substance Problems



Source: OAS (2000) 1998 Treatment Episode Data Set (TEDS)

# Level of Care at Admission



Source: OAS (2000) 1998 Treatment Episode Data Set (TEDS)

# The Emergence of Adolescent Treatment Research

---

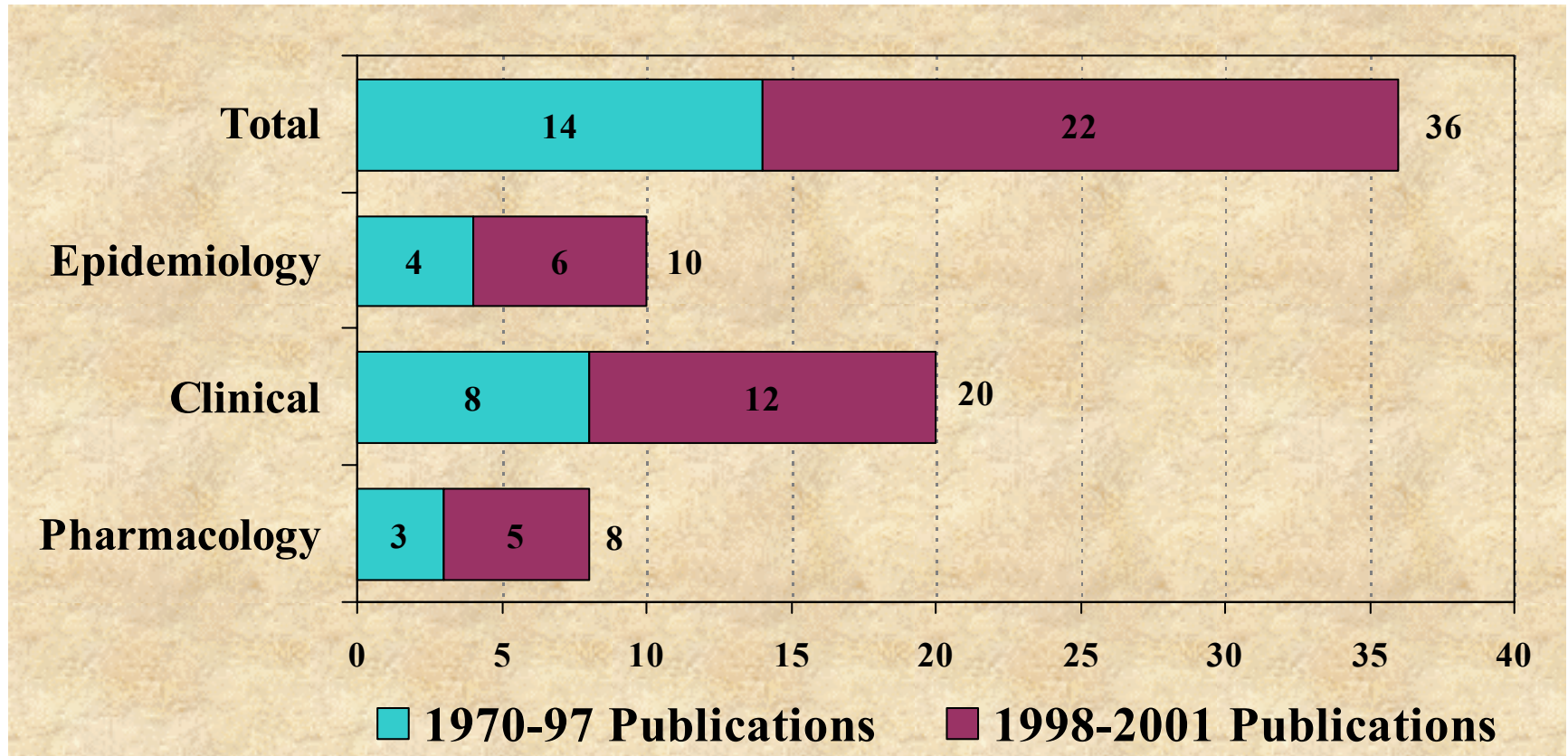
- Through the 1980s, most adolescent treatment and research focused on the treatment of narcotics or alcohol use and used adult models with little adaptation to adolescents.
- National evaluations of these programs (DARP, TOPS, SROS, NTIES, DATOS) produced mixed results, with outpatient treatment being associated with 20% or less change in cannabis and alcohol use.
- Only within the past 10-15 years has the field focused on creating and evaluating developmentally-appropriate models of manual-guided treatment for adolescents.

# Methodological Limitations of Early (Pre-1997) Adolescent Treatment Research

---

- Small sample sizes (most under 50)
- High rates (30-50%) of refusals by eligible people
- Unstandardized measures, no measures of abuse or dependence, no measures of comorbidity
- Unstandardized and minimally-supervised therapies (making replication very difficult)
- Minimal information on the services received
- High rates (20-50%) of treatment dropout
- High rates of attrition from follow-up (25-54%) leading to potentially large (unknown) bias

# Studies by Date of First Publication



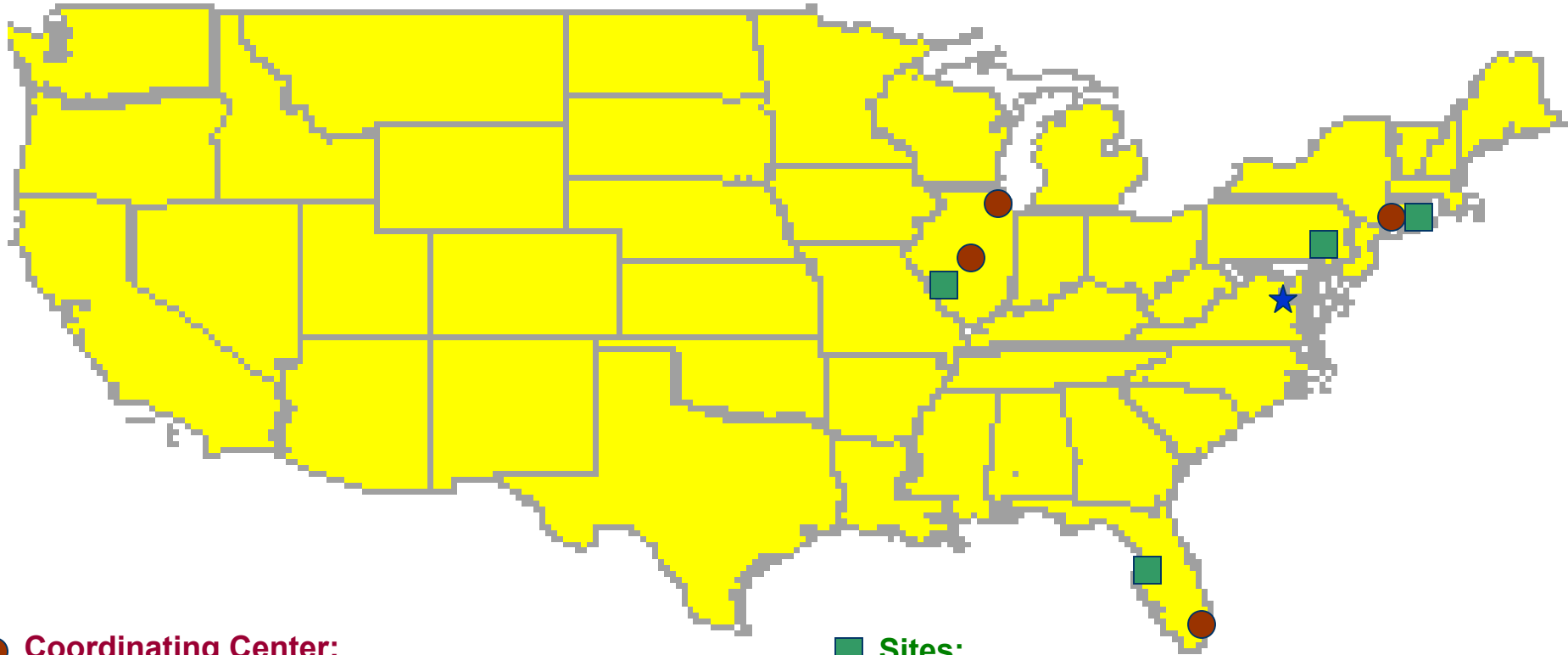
*With over 60% of the studies first published in the past 3 years and over 3 dozen more currently in the field, we are entering a “renaissance of knowledge” in this area.*

# The Renaissance (1997 to Present) in Adolescent Treatment Research

---

- **1997-present** The number of adolescent studies funded by CSAT, NIAAA, NIDA, and foundations increased by 400+%.
- **1997-present**, CSAT funded the CYT multi-site experiment to evaluate the effectiveness of five promising approaches to adolescent outpatient treatment.
- **1998-present**, CSAT/NIAAA funded a group of 14 research studies on early intervention and treatment of adolescents.
- **1998-present**, CSAT funded 10 grants to manualize exemplary adolescent programs and rigorously evaluate them.
- **2000-present**, NIDA started releasing the 12-month outcomes from its DATOS-Adolescent study of 1700 adolescents in a 1994-95 admission cohort.
- **2000-present**, CSAT funded a 30-month follow-up of 1200 adolescents as part of its PETS-Adolescent Study.

# CYT Part 2: Design of the Cannabis Youth Treatment (CYT) Experiment



- **Coordinating Center:**  
Chestnut Health Systems, Bloomington, IL,  
and Chicago, IL  
University of Miami, Miami, FL  
University of Conn. Health Center, Farmington, CT

- **Sites:**  
Univ. of Conn. Health Center, Farmington, CT  
Operation PAR, St. Petersburg, FL  
Chestnut Health Systems, Madison County, IL  
Children's Hosp. of Philadelphia, Phil., PA

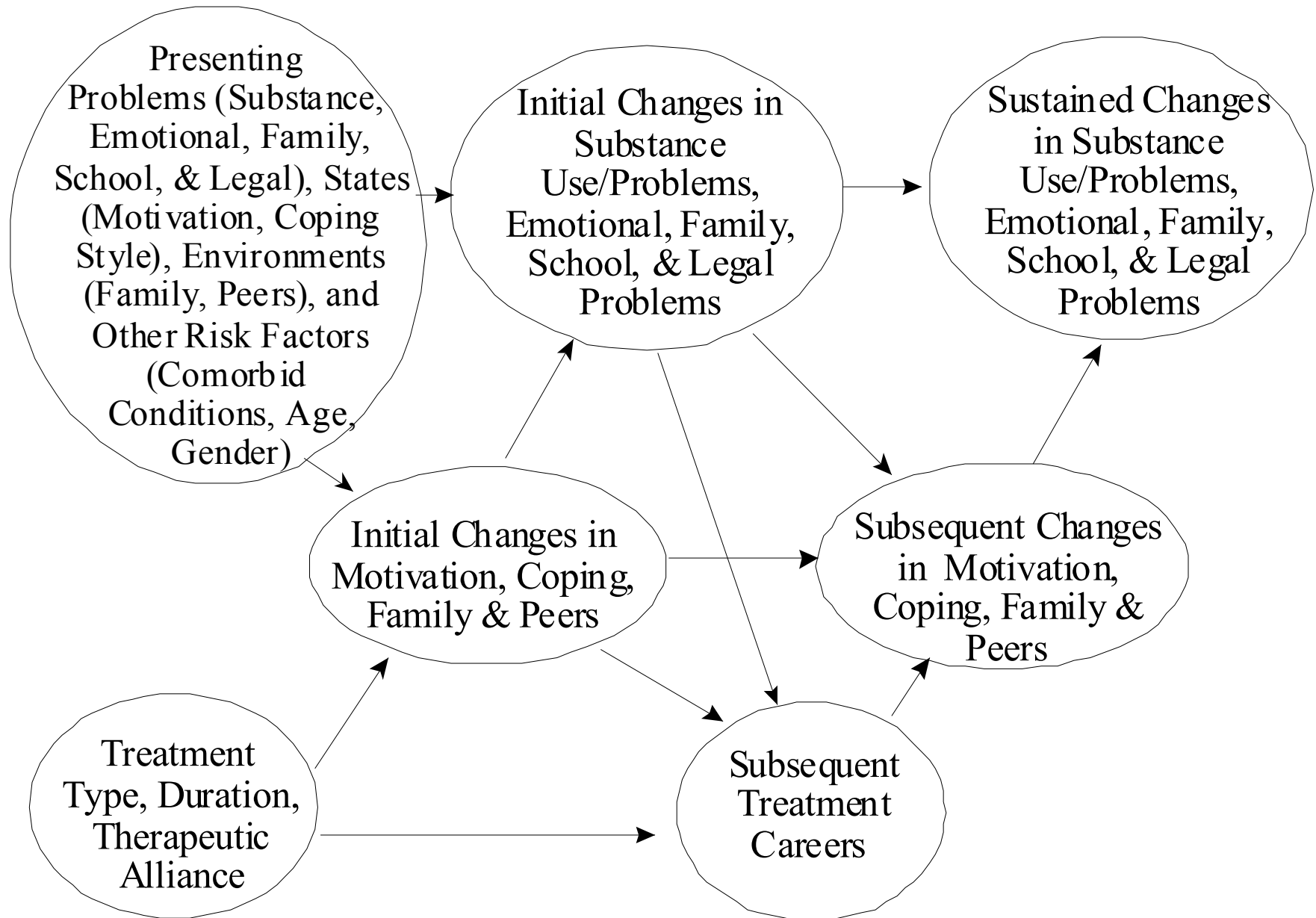
- ★ **Sponsored by:** Center for Substance Abuse Treatment (CSAT), Substance Abuse and Mental Health Services Administration (SAMHSA), U.S. Department of Health and Human Services

# Purpose

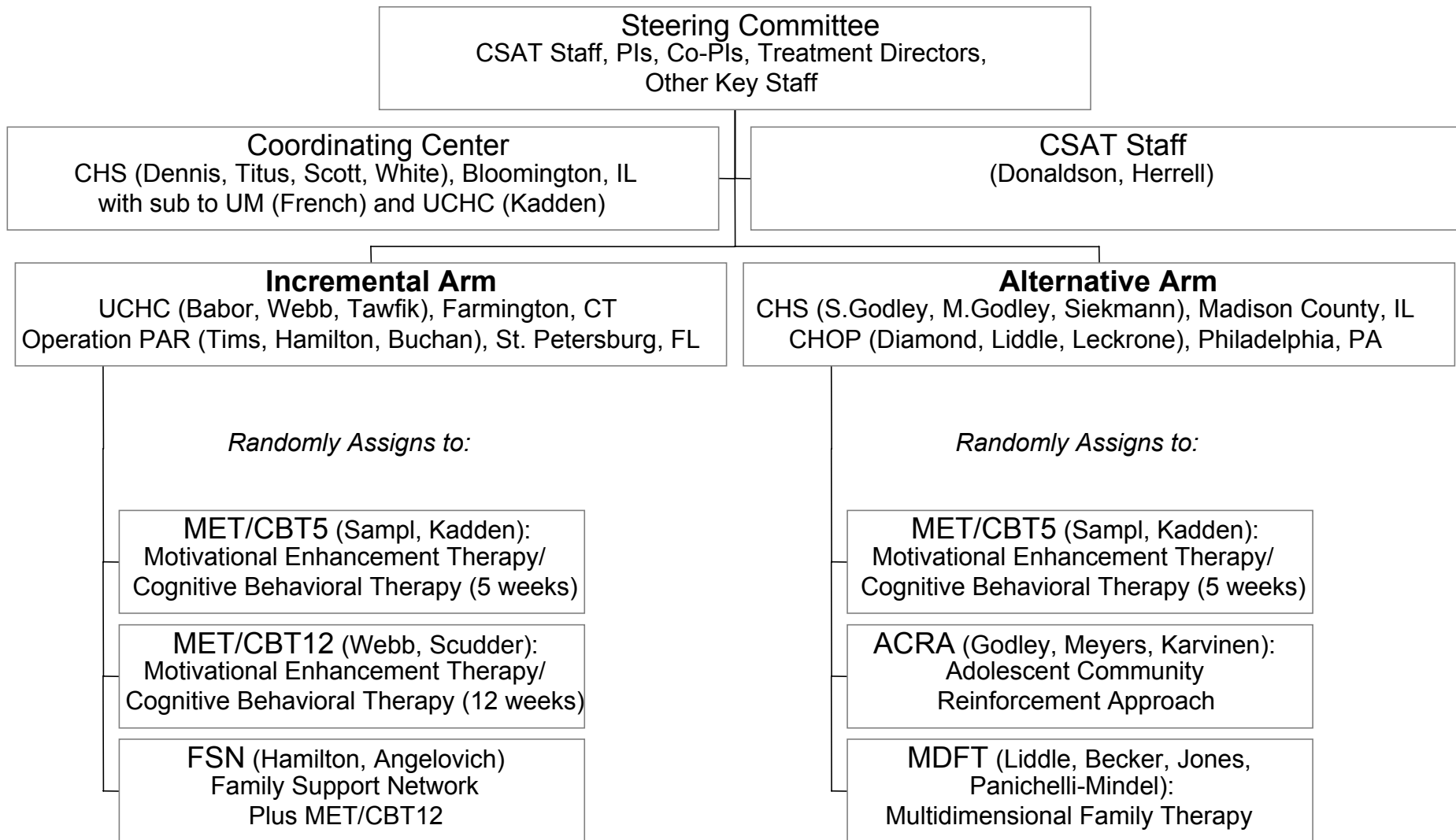
---

- To learn more about the characteristics and needs of adolescent cannabis users presenting for outpatient treatment.
- To adapt evidence-based, manual-guided therapies for use in 1- to 3-month adolescent outpatient treatment programs in medical centers or community-based settings.
- To evaluate the relative effectiveness, cost and cost-effectiveness of five interventions targeted at cannabis use and associated problems in adolescents.
- To provide validated models of these interventions to the treatment field in order to address the pressing demands for expanded and more effective services.

# General Logic Model



# Organization



# Target Population and Inclusion Criteria

- **Target Population:** Adolescents with cannabis disorders who are appropriate for 1 to 3 months of outpatient treatment.
- **Inclusion Criteria:**
  - 12 to 18 years old
  - 1+ DSM-IV lifetime symptoms of Cannabis Abuse or Dependence disorders
  - used cannabis in the past 90 days (or 90 days before being in a controlled environment)
  - meet ASAM (1996) patient placement criteria for level I (outpatient) or level II (intensive outpatient)

# Exclusion Criteria

- For Safety and Logistical Reasons we did exclude adolescent who had:
  - used alcohol daily or other drugs weekly because they suggested the need for more treatment
  - had acute medical or psychological conditions that would prevent them from participating in treatment
  - lived (or were about to move) outside of the program's catchment area and would not be able to participate
  - had a history of very violent or predatory behavior that might put other adolescents in group at risk
  - insufficient ability to use English
  - no family member or other collateral to participate in the evaluation, or
  - previously participated in the study

# We Did Take Many Adolescents with



- Prior substance abuse treatment histories
- Co-occurring medical or psychological conditions that were manageable in an outpatient level of care
- conduct disorder and behavior problems
- criminal justice system involvement
- non-traditional family structures
- alcohol and/or drug use in their homes
- high rates of victimization and multiple other problems

# Implementation

---

- Over 85% of eligible families agreed to participate
- Quarterly follow-up of 94 to 98% of the adolescents from 3 to 12 months (88% had all five interviews)
- Collateral interviews and urine test data were obtained at intake, 3 and 6 months on over 85% (90% of the adolescents who were not incarcerated or interviewed by phone)
- Over 90% completion of those due in a 30-month follow-up that is currently underway
- Cost data paper in press and a benefit-cost paper under preparation

# Adolescent Data Sources

---

- Global Appraisal of Individual Needs (GAIN)
- Participant Screener Form (PSF)
- Adolescent Reasons for Quitting (ARFQ)
- Family Cohesion & Conflict subscales of the Family Environment Scale (FES)
- Friends, Family and Self (FFS; Part B)
- Adolescent Relapse Coping Questionnaire (ARCQ)
- SCID II personality questionnaire (SPQ; cluster B)
- Dimensions of Temperament Survey-Revised (DOTS-R)
- Working Alliance inventory by adolescent, therapist and family members at 2 and 5 weeks
- Discharge questionnaire

# Other Data Sources

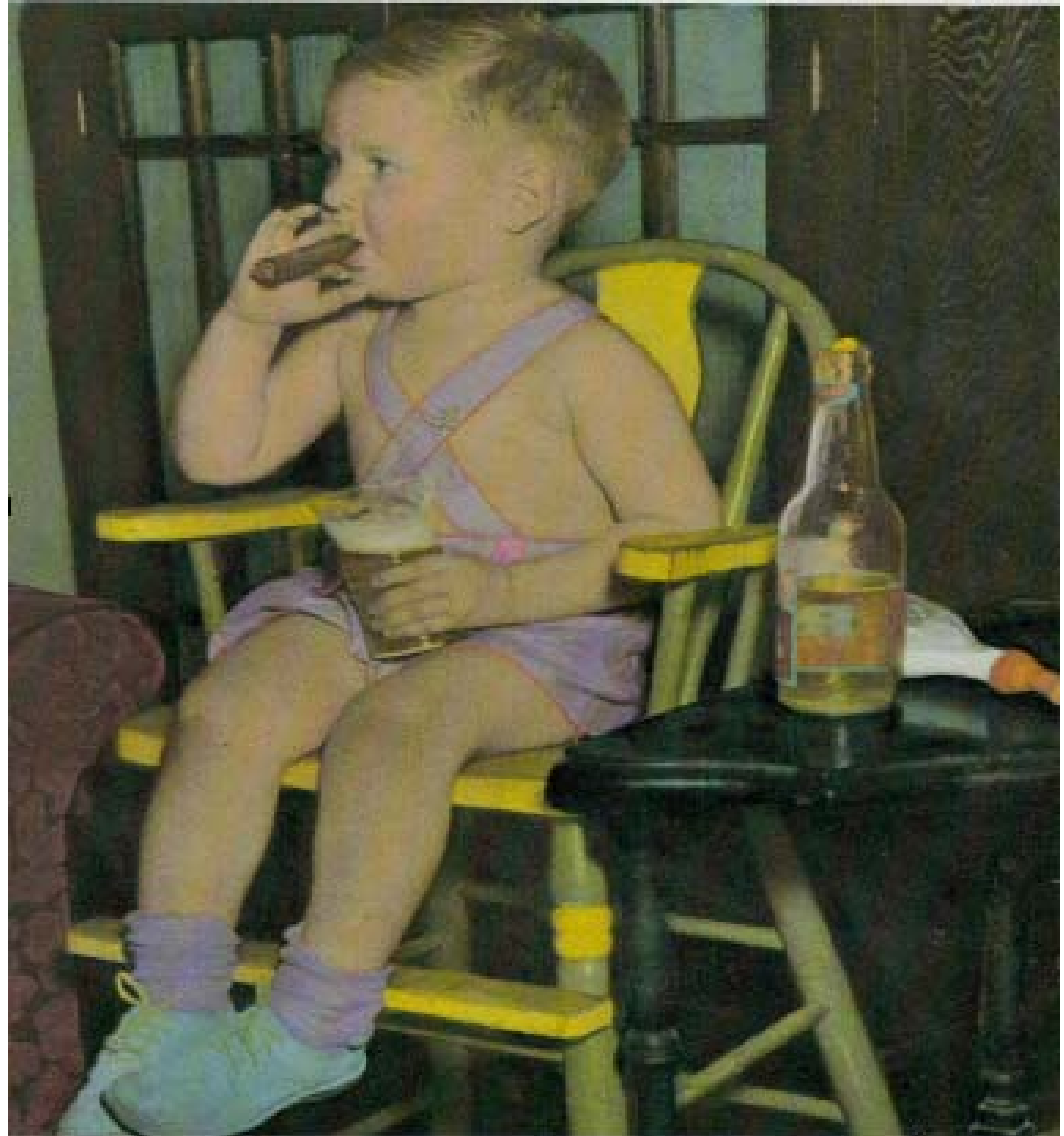
---

- **Biological:** On site urine tests for THC and cocaine and laboratory based quantitative tests on a sample of 300 interviews
- **Family/Other Collaterals:** Interviews with the CBCL, a subset of the GAIN questions, a parenting questionnaire, a discharge questionnaire, and a working alliance measure
- **Therapists:** Staff service logs, working alliance reports, discharge reports, supervisor ratings of staff skill, and supervisor rating of staff adherence to the assigned therapy
- **Economic:** Drug Abuse Treatment Cost Analysis Program

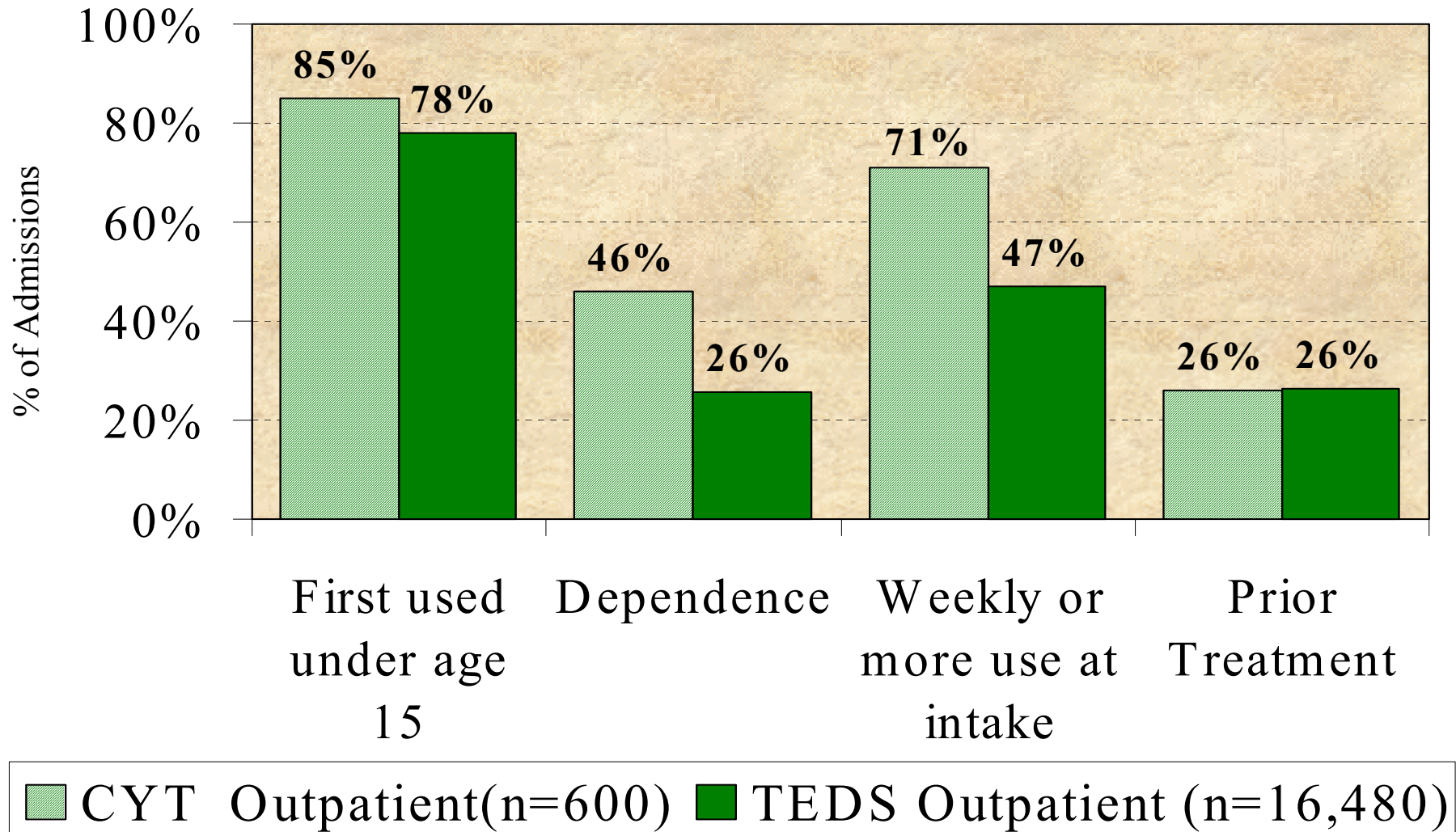
# Part 3. Intake Characteristics, Clinical Severity, and Co-occurring Problems

---

Dad, I know I wasn't  
an easy child to live with.

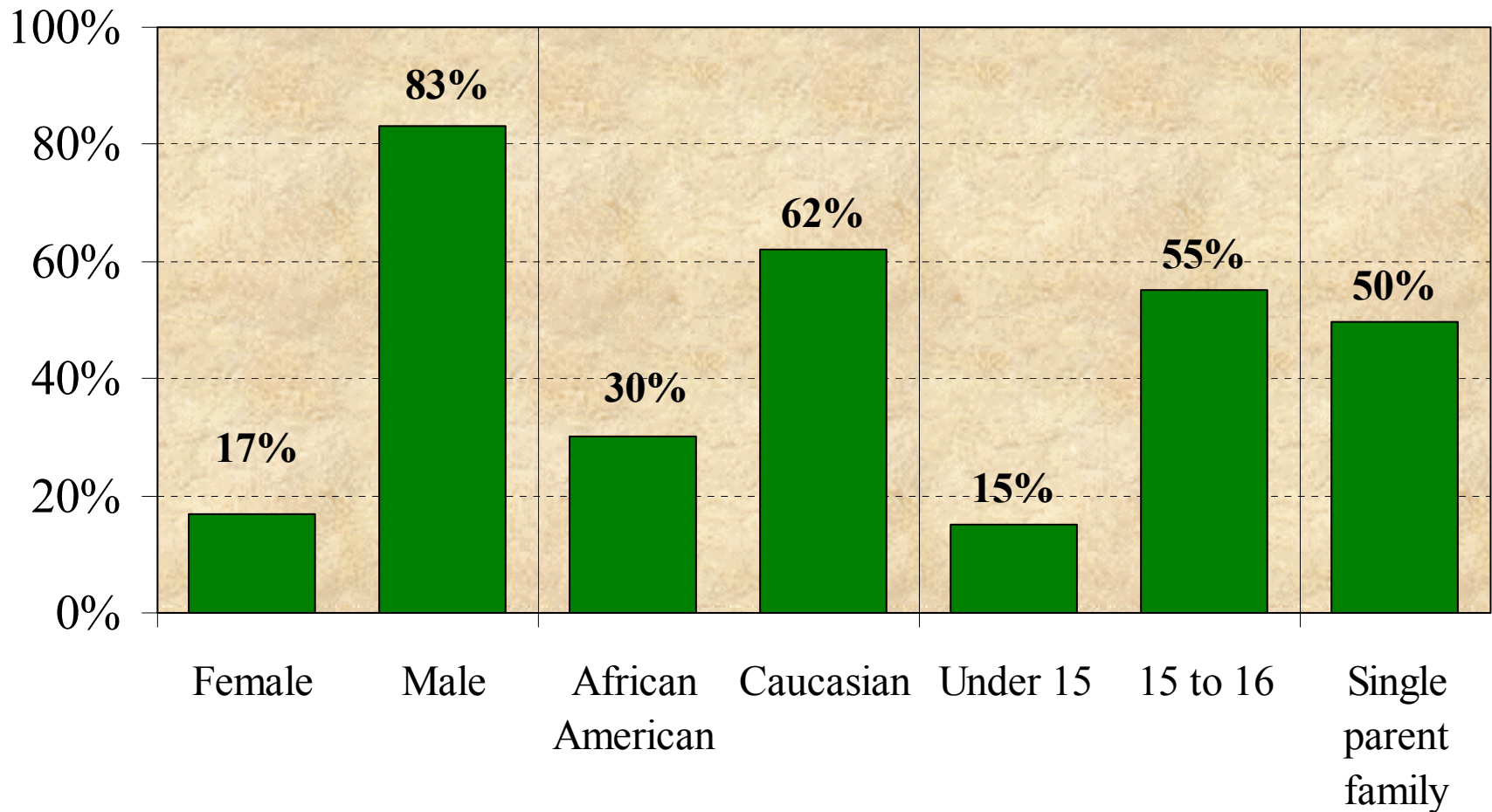


# Adolescent Cannabis Users in CYT were as or More Severe Than Those in TEDS\*

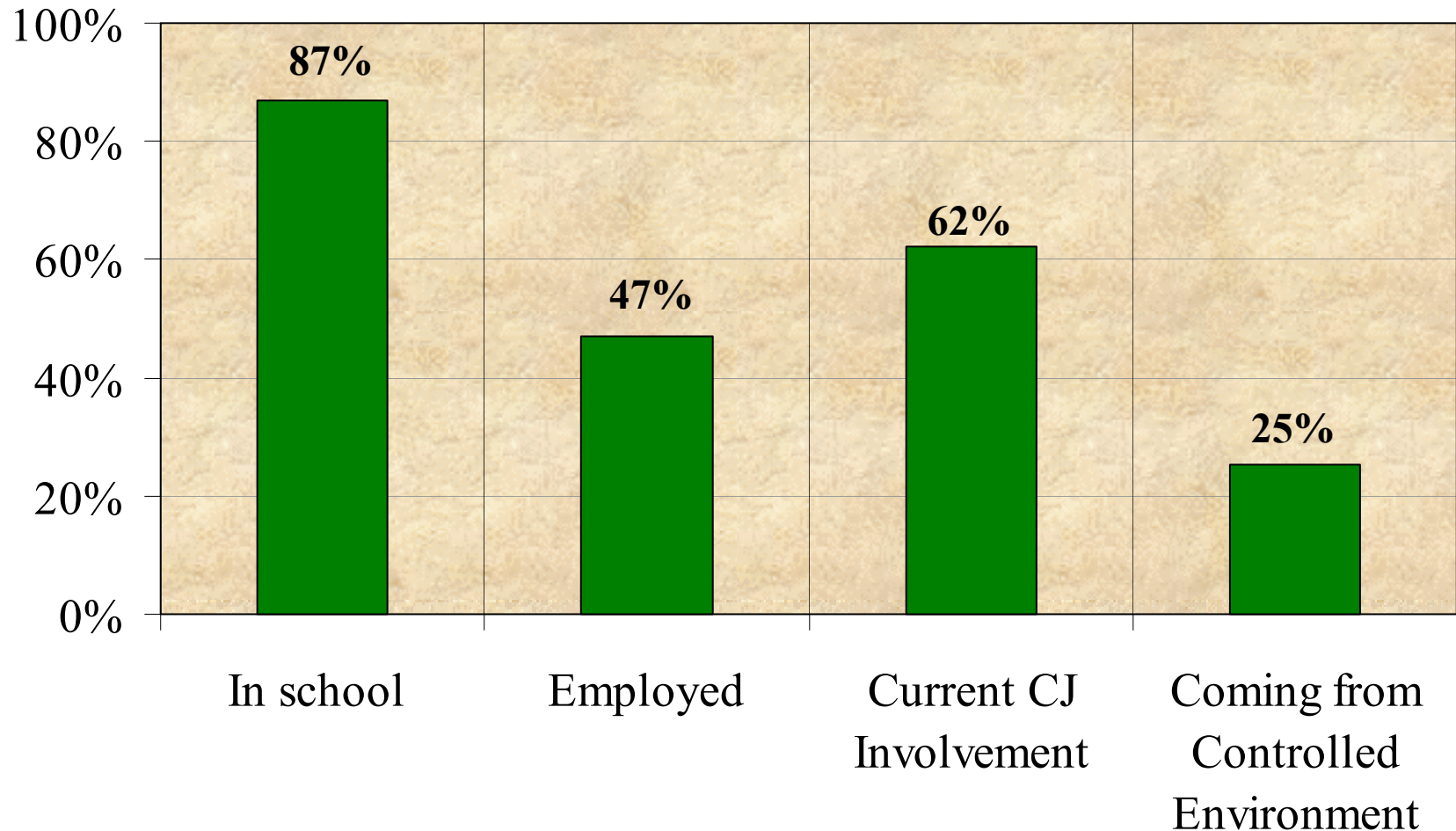


\* Adolescents with marijuana problems admitted to outpatient treatment

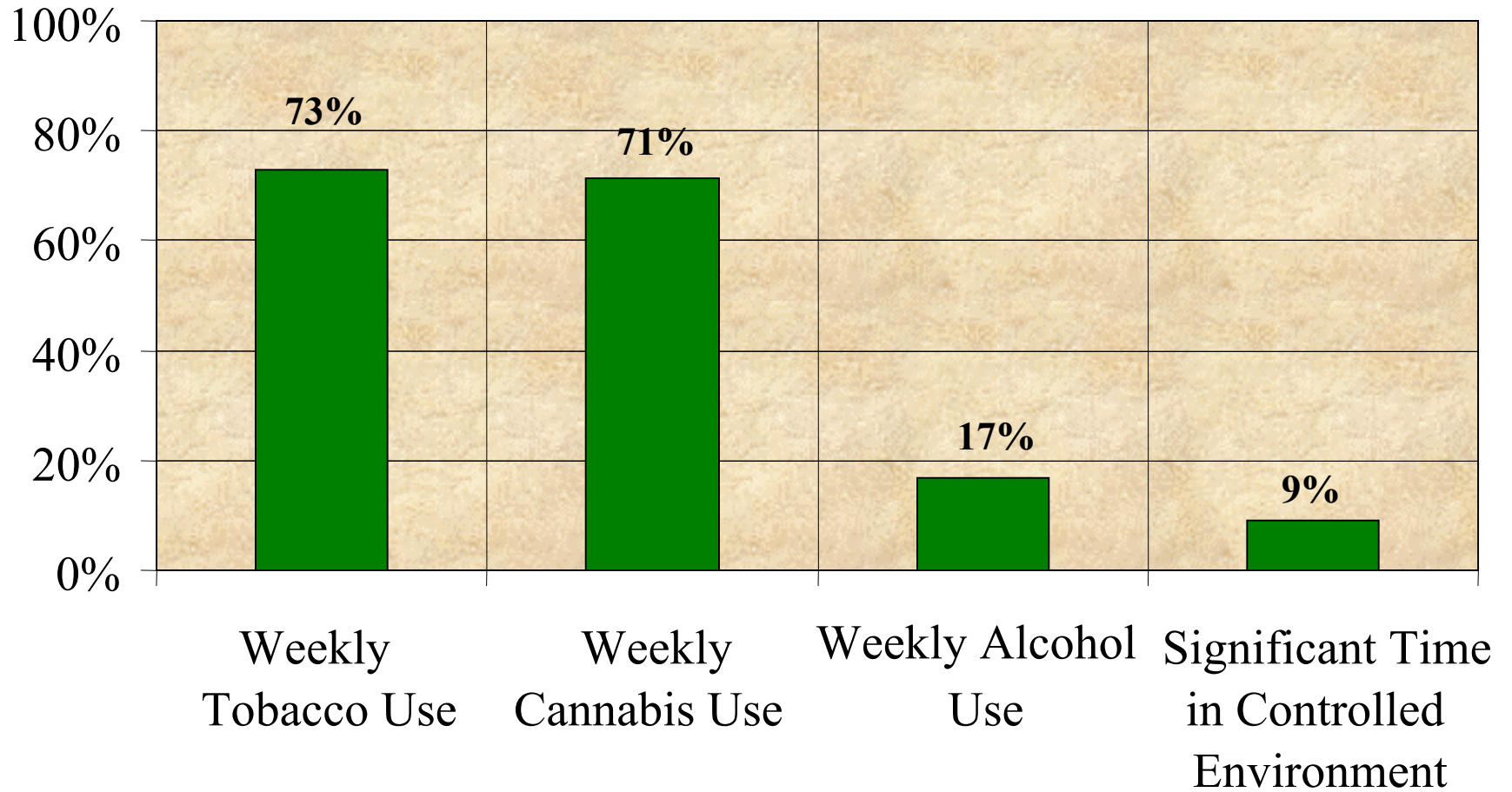
# Demographic Characteristics



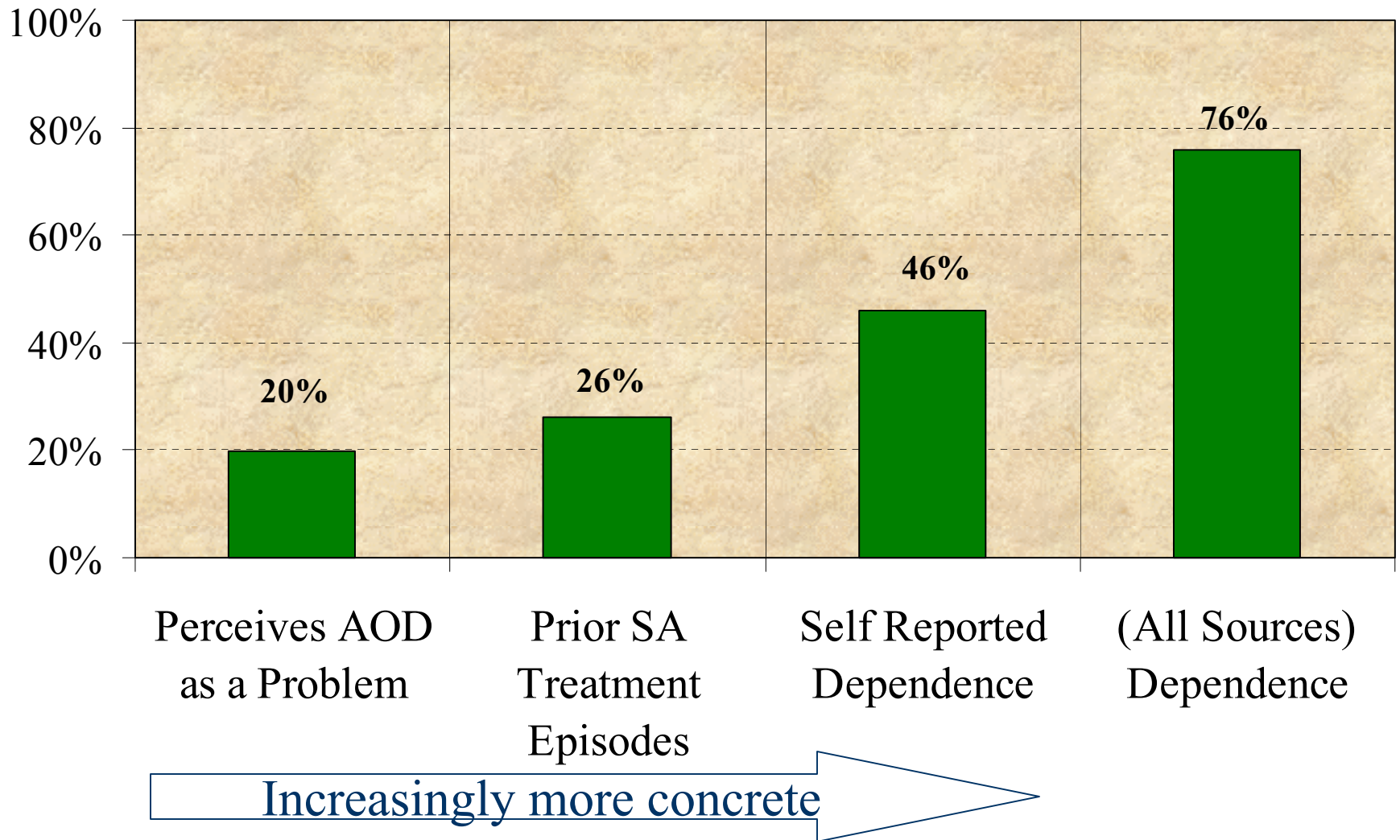
# Institutional Involvement



# Patterns of Substance Use

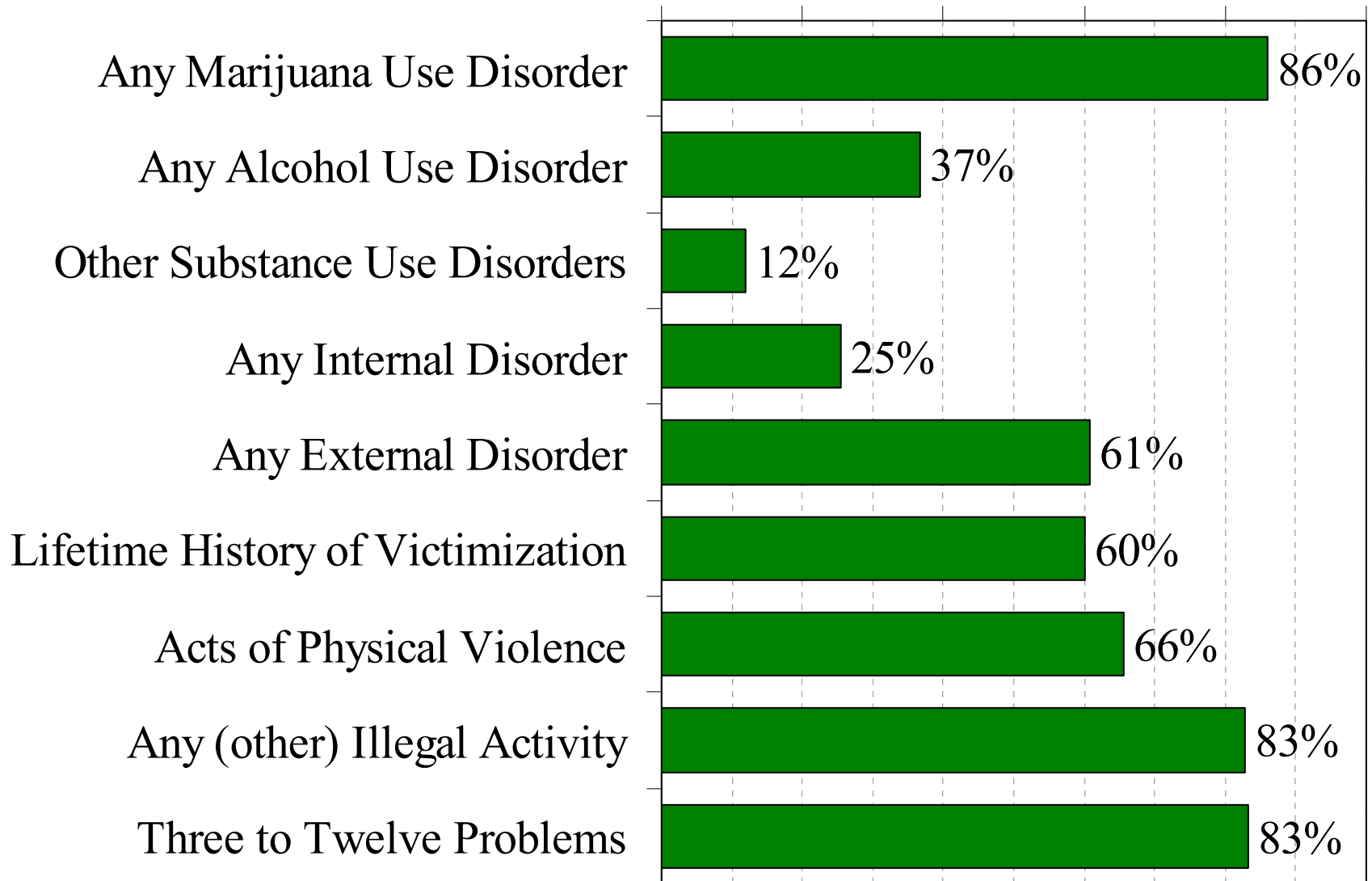


# Substance Use Disorder Severity

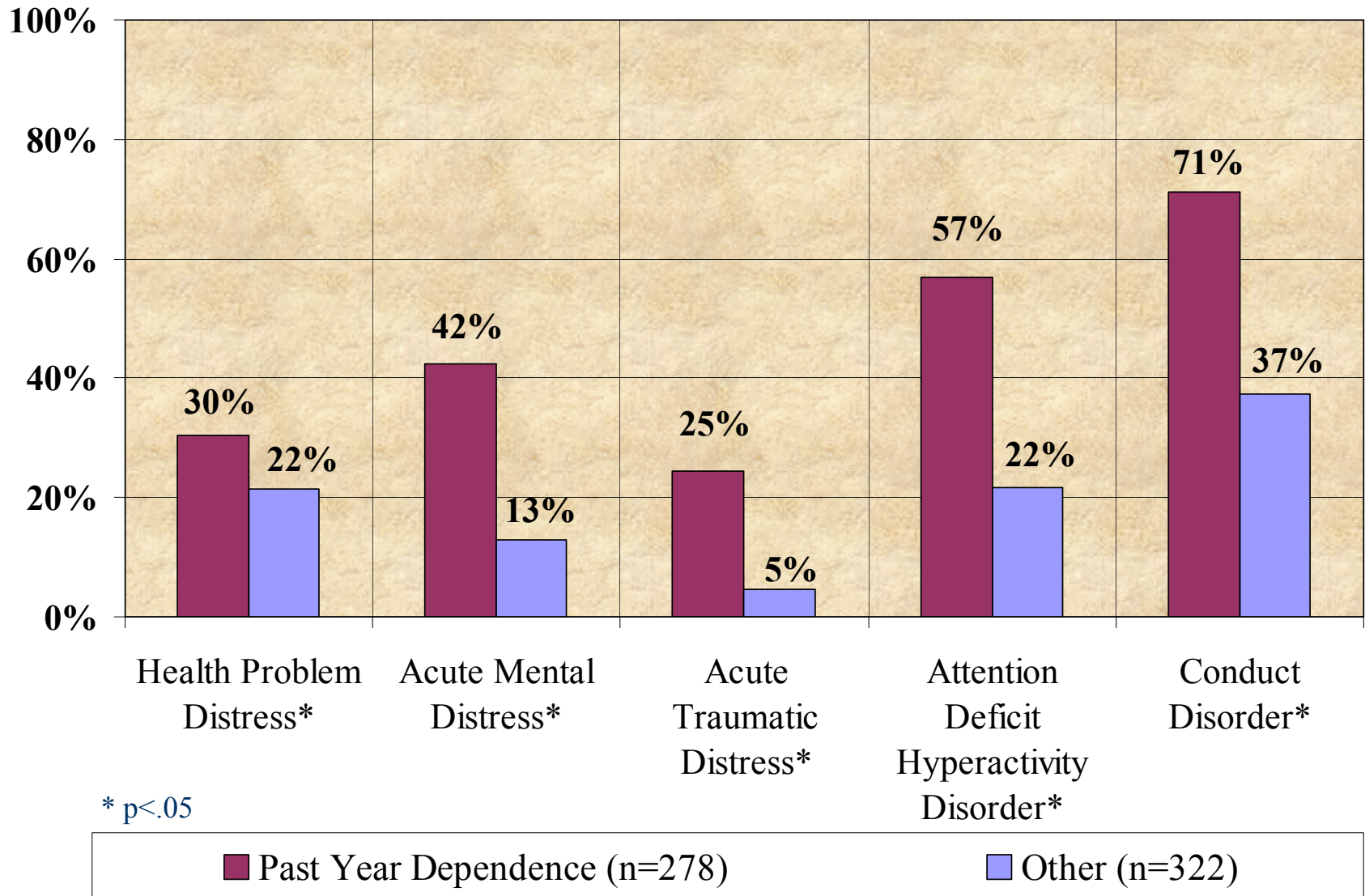


# Self-Reported Clinical Severity

0% 20% 40% 60% 80% 100%



# Co-occurring Problems are the Norm and Higher for those with Past Year Dependence



# Other Correlates of Intake Severity

---

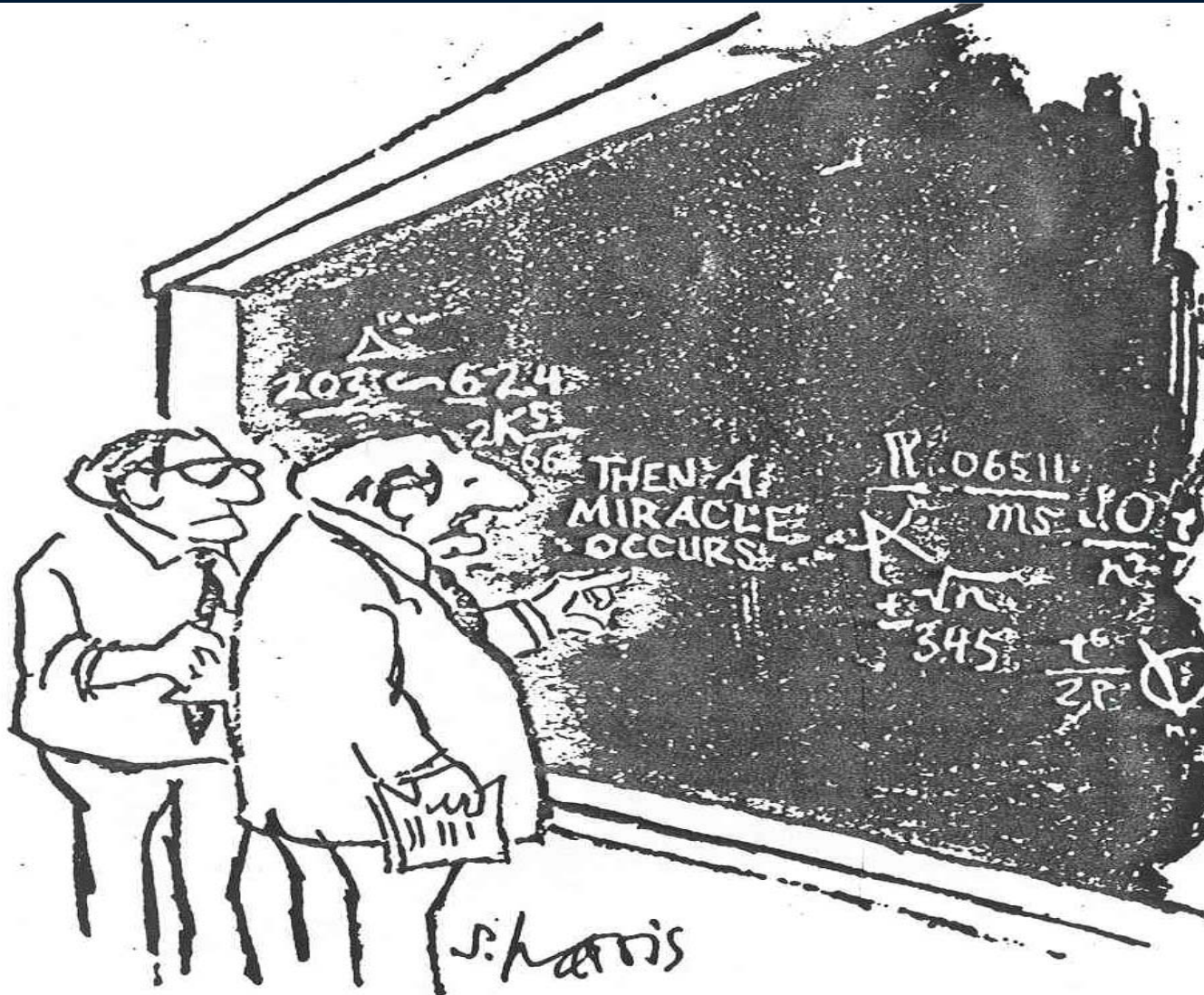
- Higher substance use severity was associated with:
  - Being above average in terms of internal distress symptoms, behavior problems, violent or criminal activity
  - Having a family history of substance use problems
  - Being female or older
  - Starting substance use before age 13
- Lower substance use severity was associated with being involved with the criminal justice system
- More severe temperament and race were not associated with intake substance use severity.

# Summary of Intake Findings

---

- The adolescents in CYT were slightly more severe than adolescents entering publicly-funded outpatient treatment in TEDS.
- Most were male, white, and involved in one or more external systems.
- The dominant pattern of substance use was tobacco, cannabis and alcohol.
- Adolescents did not abstractly recognize their substance use as a problem, but would endorse symptoms of dependence when given in concrete terms (family members identified even more).
- Most had multiple other problems that tended to covary.
- While there are certainly some problems, adolescents were internally consistent on key scales and had good test-retest reliability; they also reported more use than their parents or than detected by urine tests.

# Part 4. The CYT Treatment Models



“I think you should be more explicit here in Step 2.”

# Treatment Conditions

---

**MET/CBT5:** Motivational Enhancement and Cognitive Behavioral Therapy (5 sessions over 6 weeks).

**MET/CBT12:** Motivational Enhancement and Cognitive Behavioral Therapy (12 sessions over 12 to 14 weeks).

**FSN (+MET/CBT12):** Family Support Network + MET/CBT12 (20+ sessions over 12 to 14 weeks).

**ACRA:** Adolescent Community Reinforcement Approach (14+ sessions over 12 to 14 weeks).

**MDFT:** Multi-Dimensional Family Therapy (15+ sessions over 12 to 14 weeks).

# Expected Treatment Dosage by Condition

Type of Service	Treatment Condition				
	MET/ CBT5	MET/ CBT12	MET/ CBT12 / +FSN	ACRA	MDFT
Participant-Only Individual Sessions	2	2	2	10	8
Multiple Participant Group Sessions	3	10	10		
Parent/Collateral-Only Individual Sessions				2	3
Family Sessions/Home Visits			4	2	4
Multiple Family Group Sessions			4		
Total Formal Sessions	5	12	20	14	15
Case management/Other Contacts			As needed	As needed	As needed
Total Expected Contacts Across Type	5	12	20+	14+	15+
Expected Duration (weeks)	6	12-14	12-14	12-14	12-14
Formal Sessions Per Week (Intensity)	0.8	0.9	1.5	1.1	1.2

# Therapists

---

- Were from existing programs and new hires with an average age of 37 (ranging from 24 to 55),
- Had an average of 7 years of experience counseling adolescents (ranging from 0 to 23),
- Had either a bachelor's degree (30%), master's degrees, (50%) or doctoral degree (20%),
- Most (75%) had no previous experience with manual-guided therapy or randomized experiments.
- Approximately 15 to 20 clients per staff person
- During the course of the two-year treatment phase, about 1/3 of the clinical staff were replaced due to turnover.

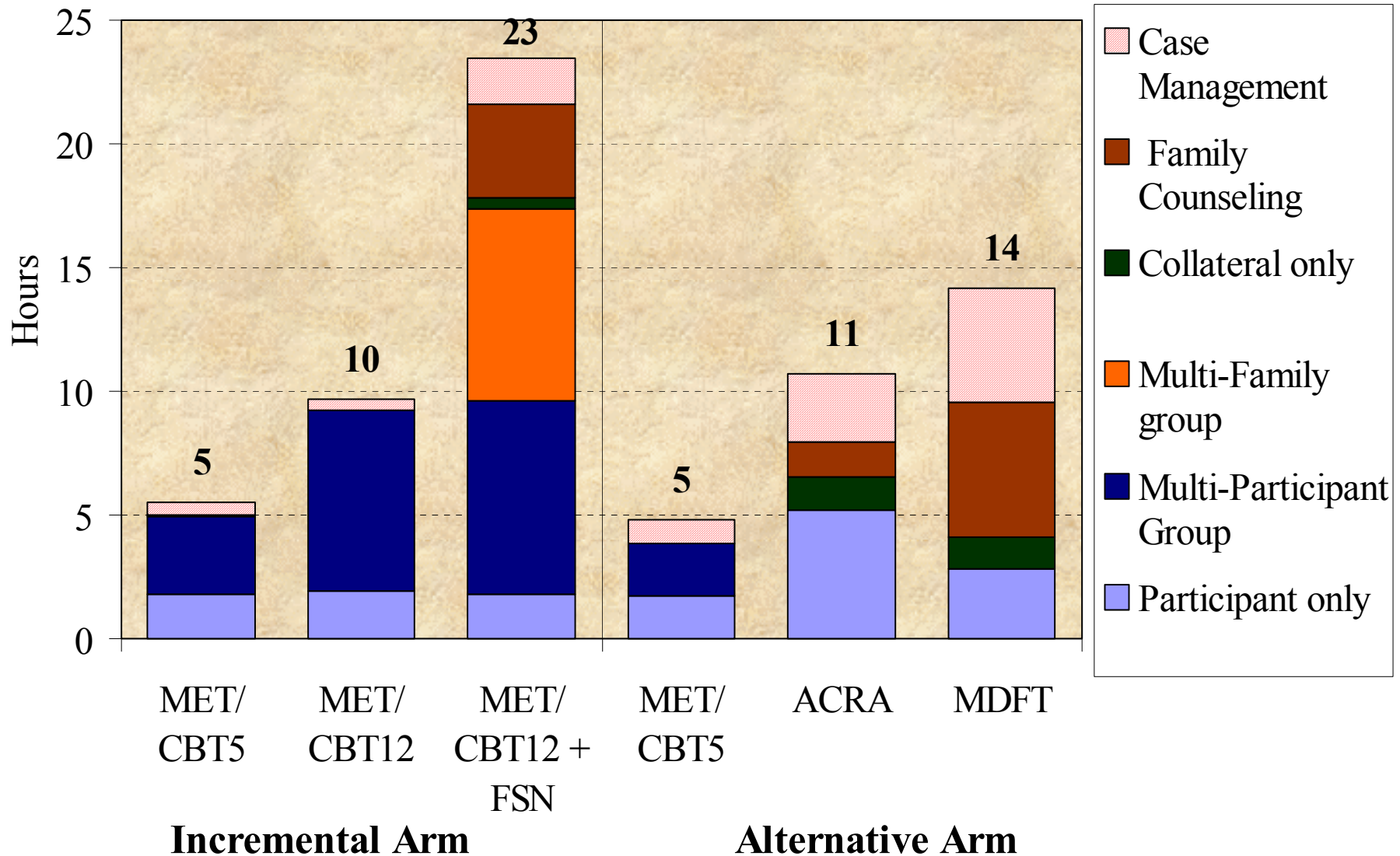
# Training, Supervision and Quality Assurance

- Each protocol developed a manual-guided approach with an expert, and cross-site clinical supervisor
- Centralized initial training with manual including all materials, forms, and quality assurance procedures
- Cross-site “protocol” supervisor reviewed all taped sessions until certified and provided individualized feedback; also meeting weekly by teleconference with all staff in protocol
- On-site staff provide direct supervision and crisis back up/counseling
- Site visits at 1 and 12 months to check on implementation and provide follow-up training

# Treatment Participation Results

- Over 71% completed most of their prescribed sessions, 22% received partial dosages, and 5% were randomized but never received treatment.
- The mean length of stay in the 13-week interventions was 80 of 90 days, with 81% getting 42 or more days (the national average in DATOS-A).
- The mean length of stay in the six-week intervention was 43 of 42 days.
- The treatment received varied significantly in type, mode, and hours of services received.

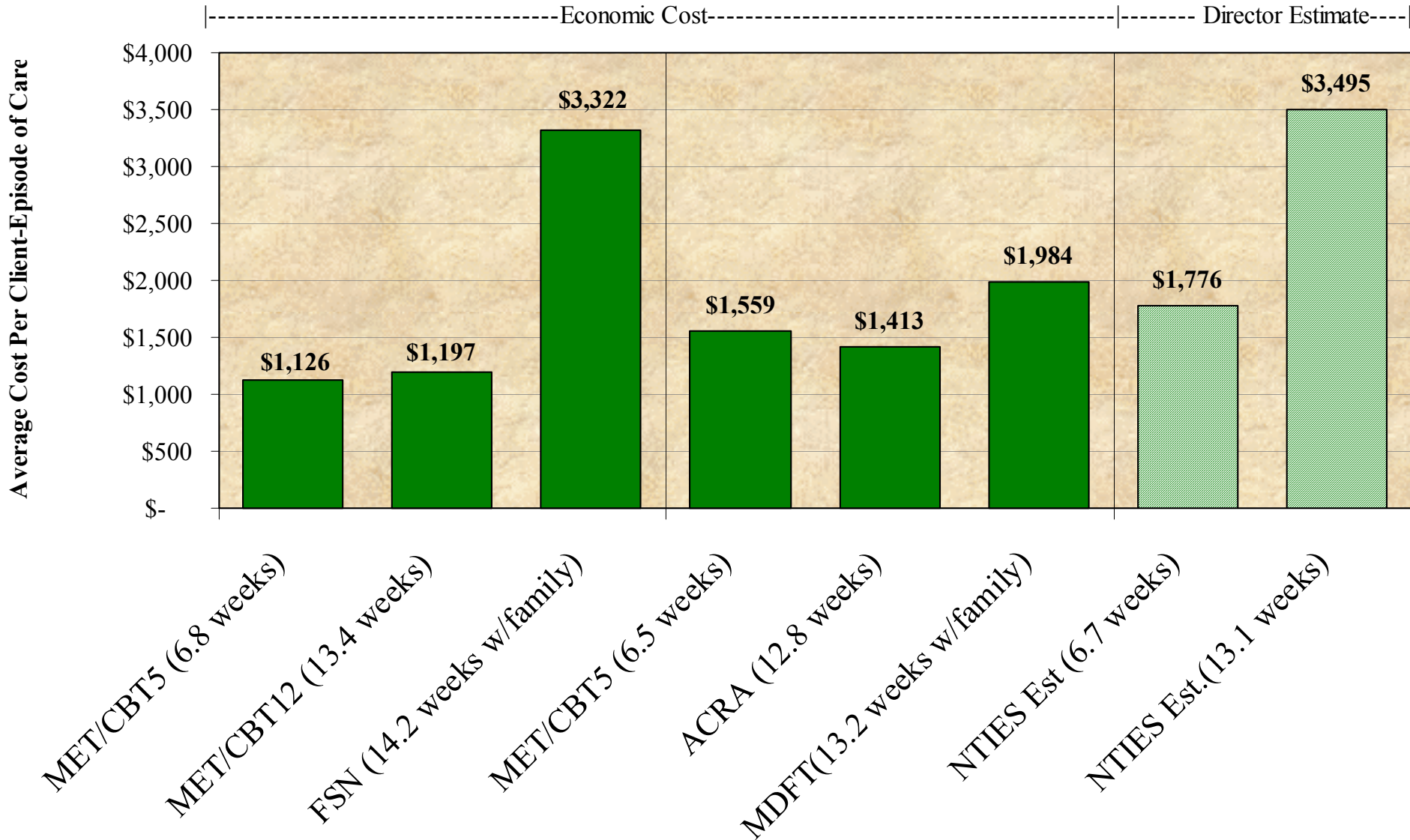
# Hours of Treatment Received by Condition



# Therapists' Reactions to Manual Guided Therapy

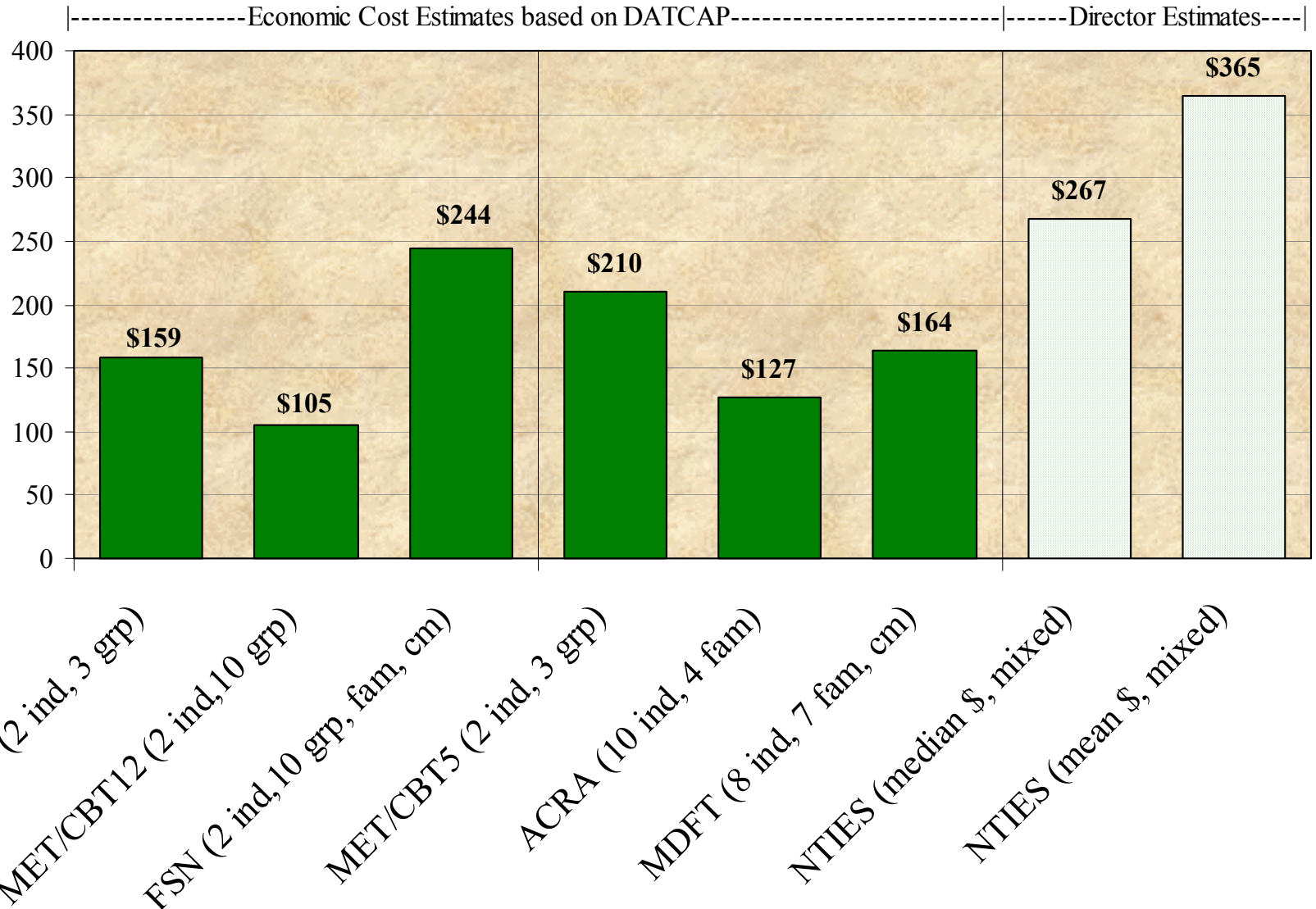
- The overall reaction was very positive.
- The things the staff liked most were
  - the improved quality and intensity of clinical supervision
  - ability of the manuals to help provide clinical focus and reduce therapist drift
  - the age appropriateness of the material
  - the structure, consistency, ease of use
  - enough flexibility to individualize for client needs
- Recommendations for further development:
  - more discussion about when and how to deviate
  - better linkage between assessment and treatment
  - more on how to deal with problem behaviors
  - more on how to work with family (in non-family manuals)
  - more culturally diverse and local examples

# Average Episode Cost (\$US) of Treatment

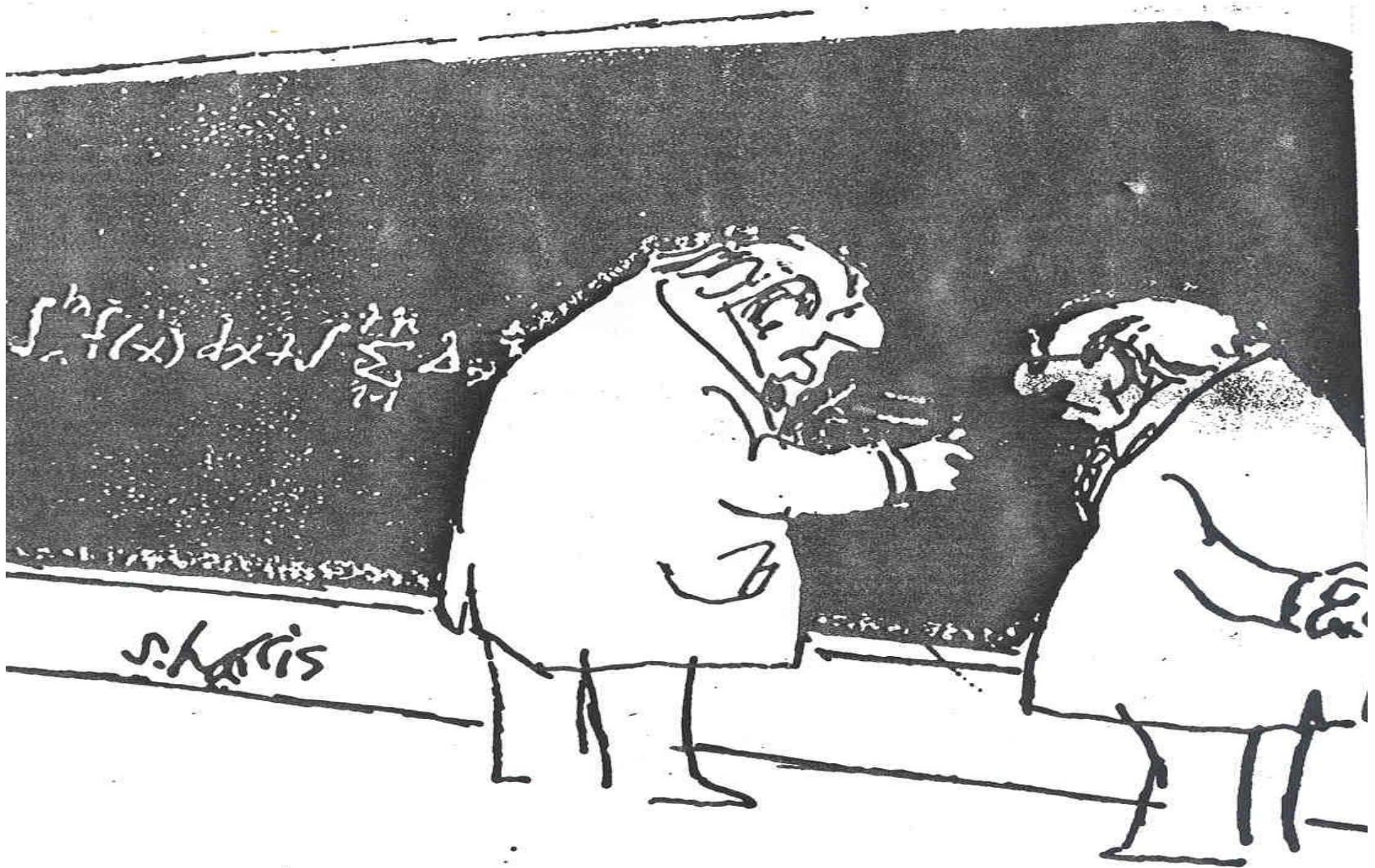


# Average Weekly Cost (\$US) of Treatment

Average Cost Per Client-Week

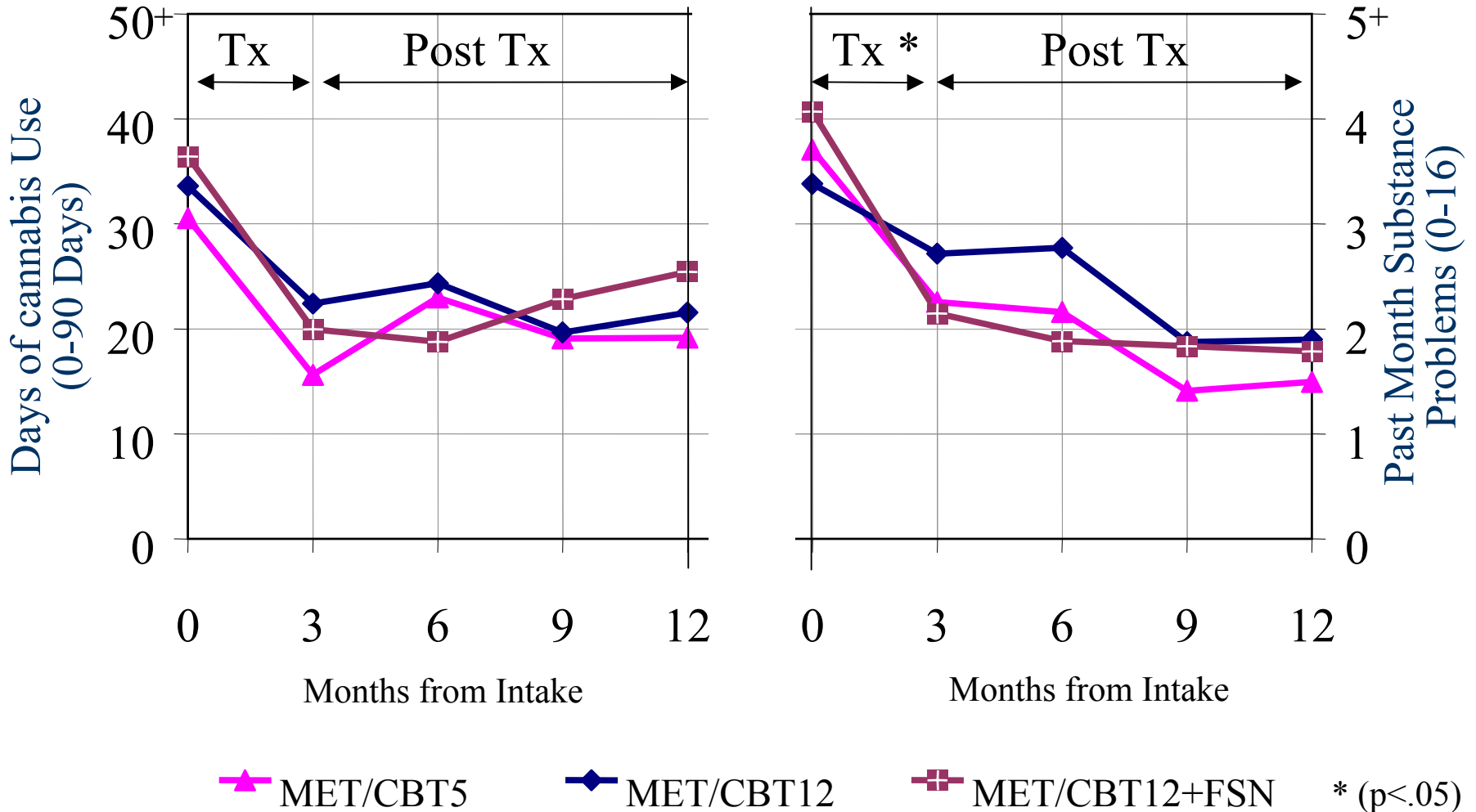


## Part 4. The Outcomes

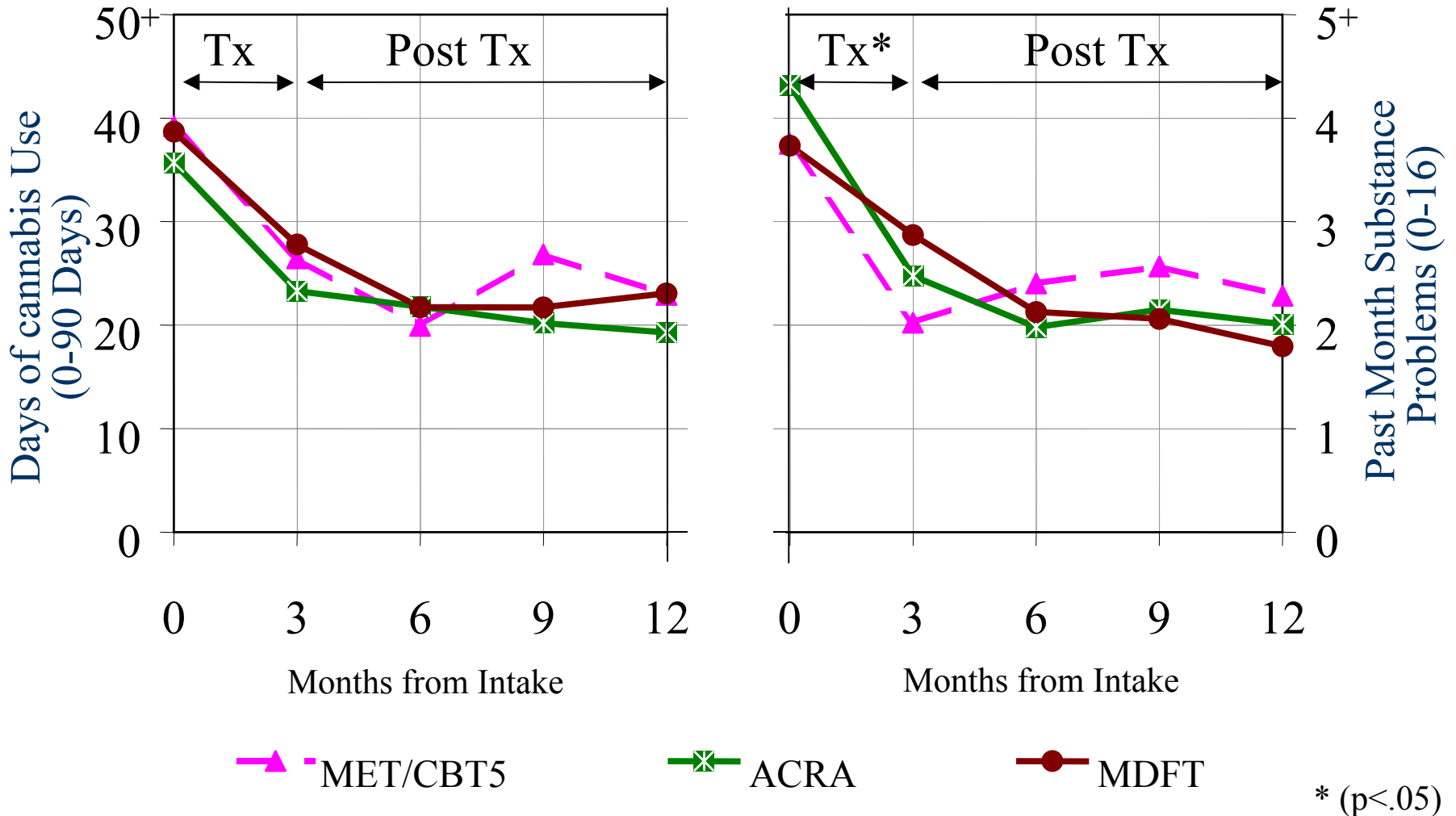


“This is the part I always hate.”

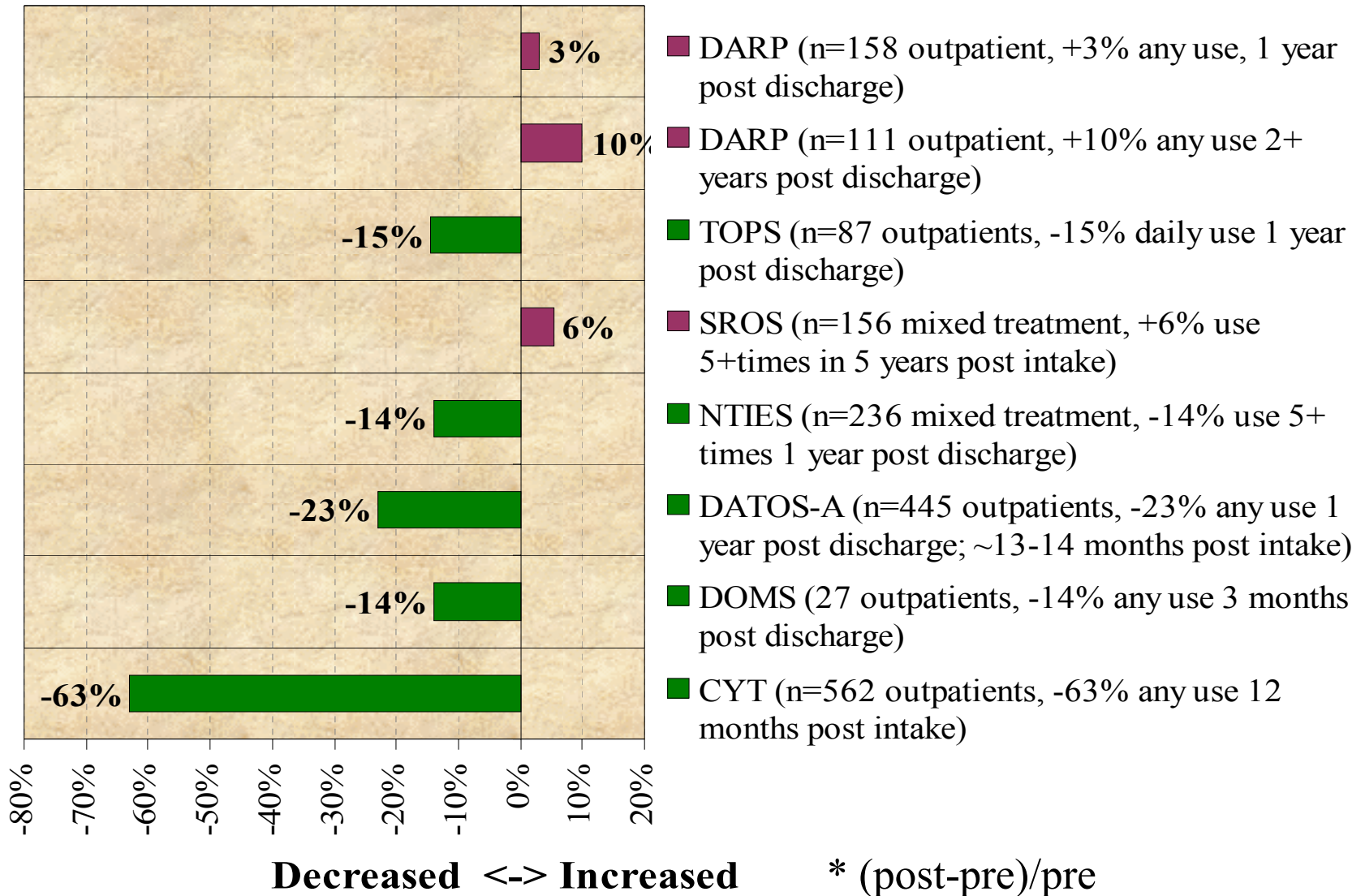
# Incremental Arm Outcomes: Does Dosage Matter?



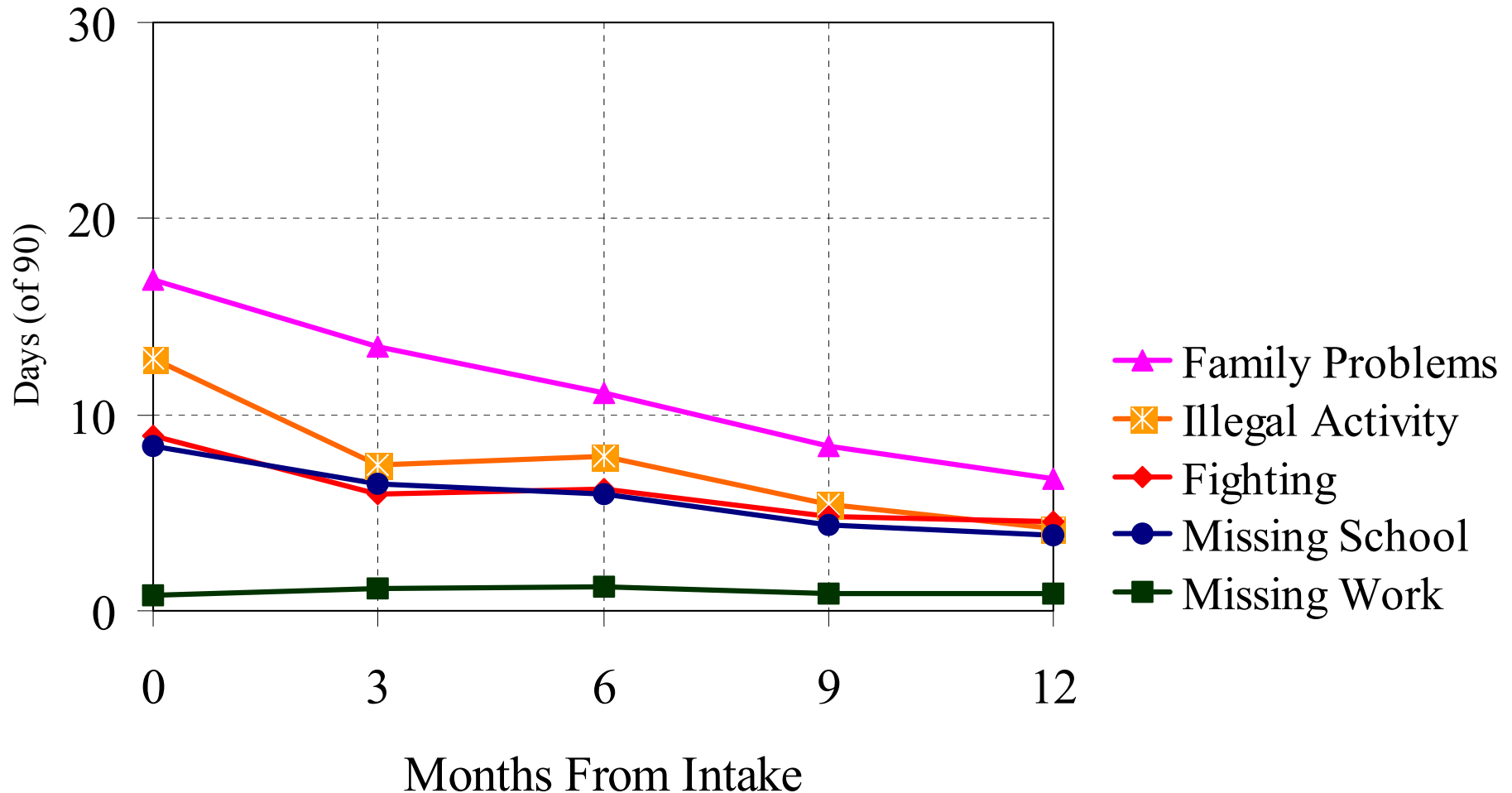
# Alternative Arm Outcomes: Does Treatment Type Matter?



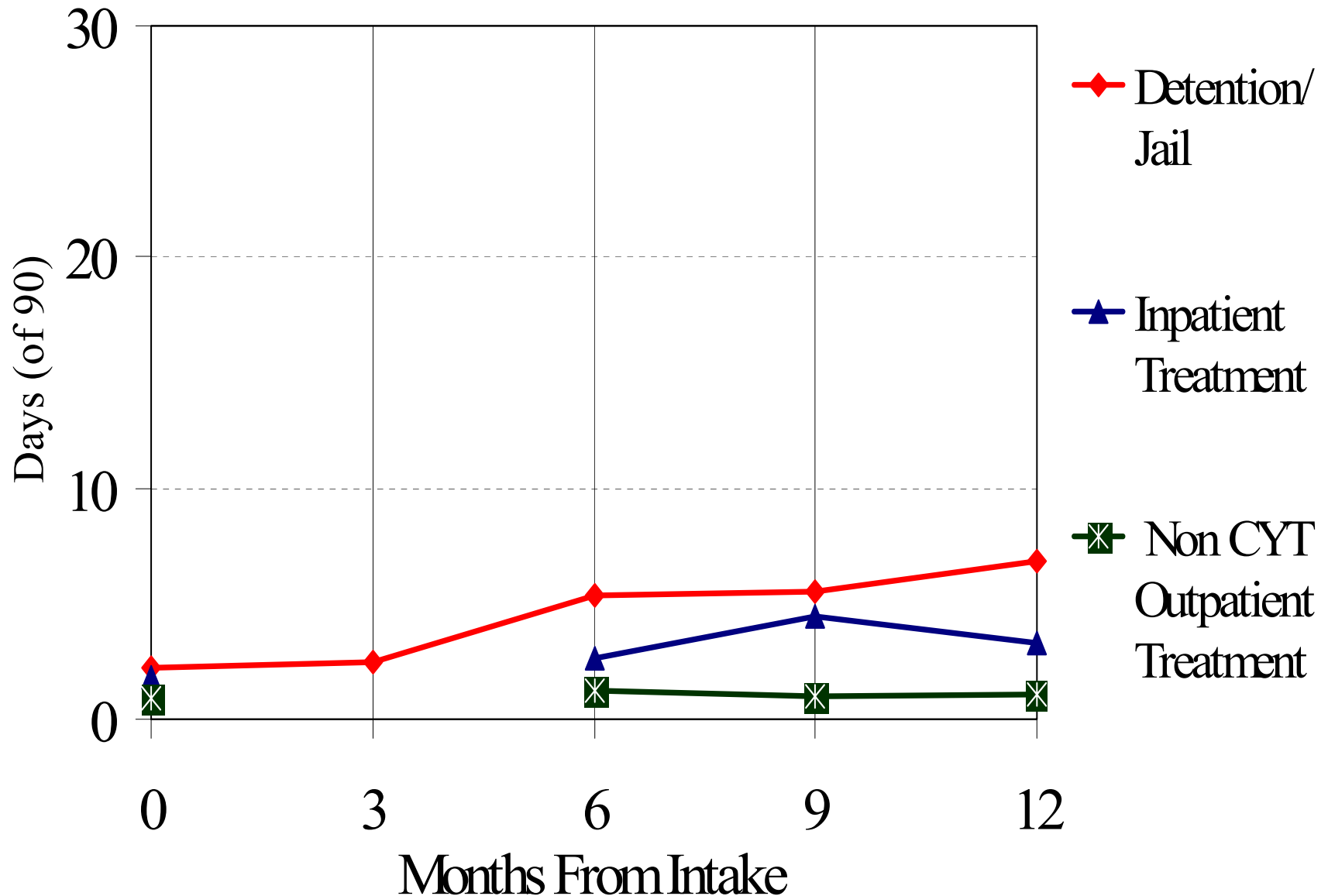
# While There is Still Room for Improvement, Effectiveness\* Does Appear to be Improving



# Indirect Impact on Co-Occurring Problems



# Days of Other Treatment and Incarceration

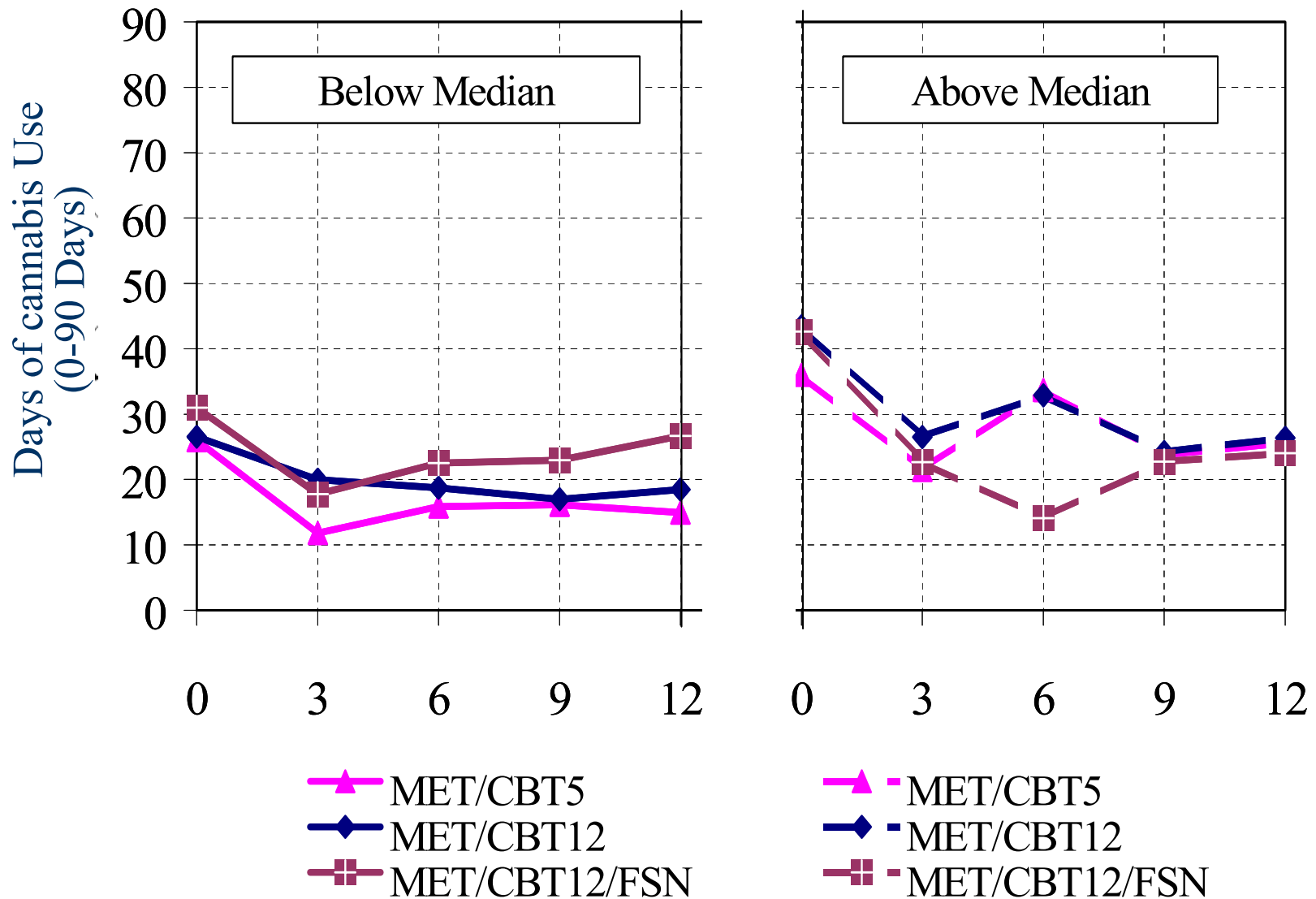


# Treatment Matching Effects

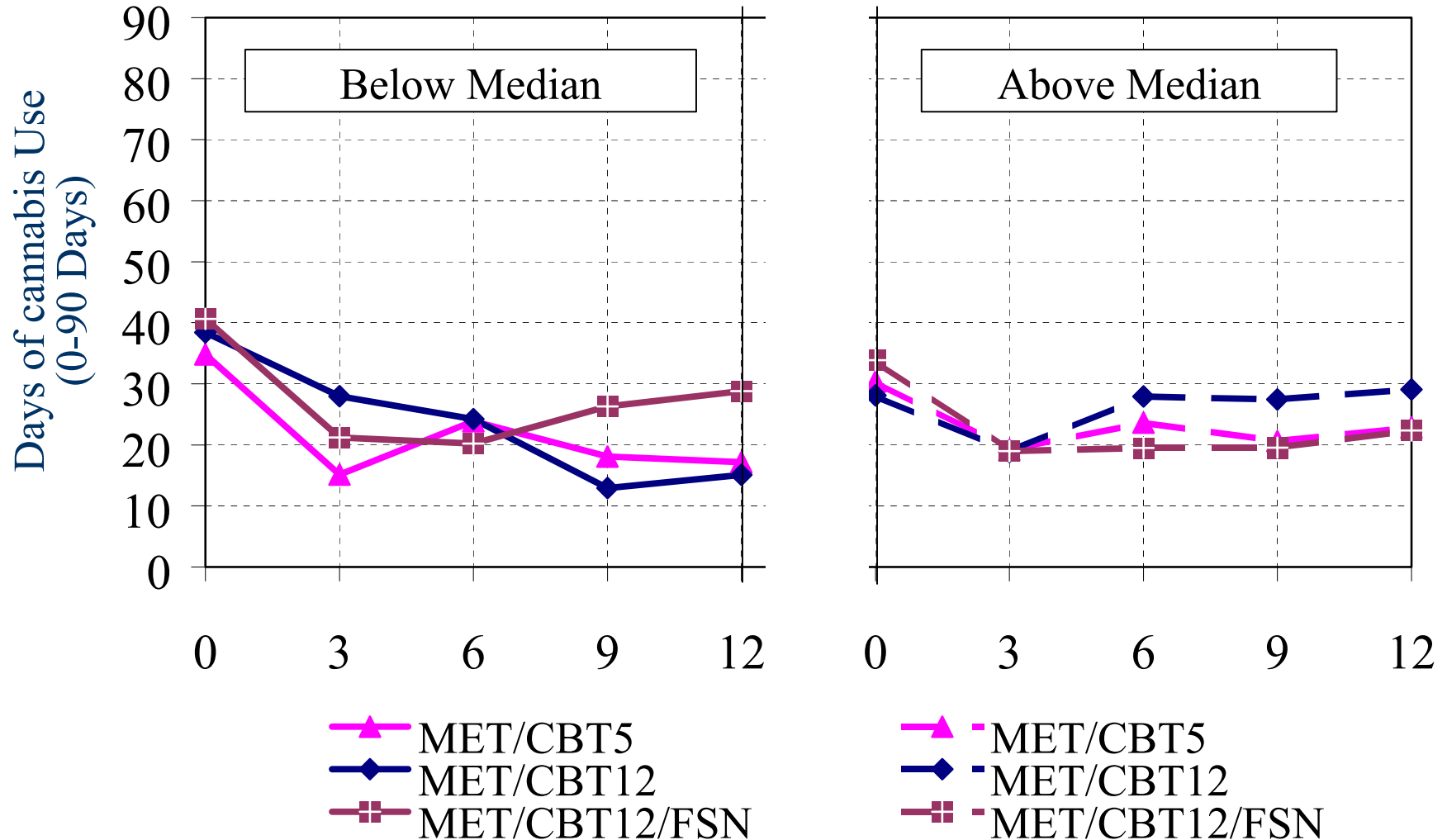
---

- There were several small but significant interactions of time by condition by internal distress, behavior problems, and violence/criminal activity.
- In the incremental arm there were interactions between time, condition and several subject variables (internal distress, substance use severity, behavioral problems, violence/illegal activity at intake, and temperament).
- There were no time by condition by subject interactions in the alternative arm for days of use or problems.

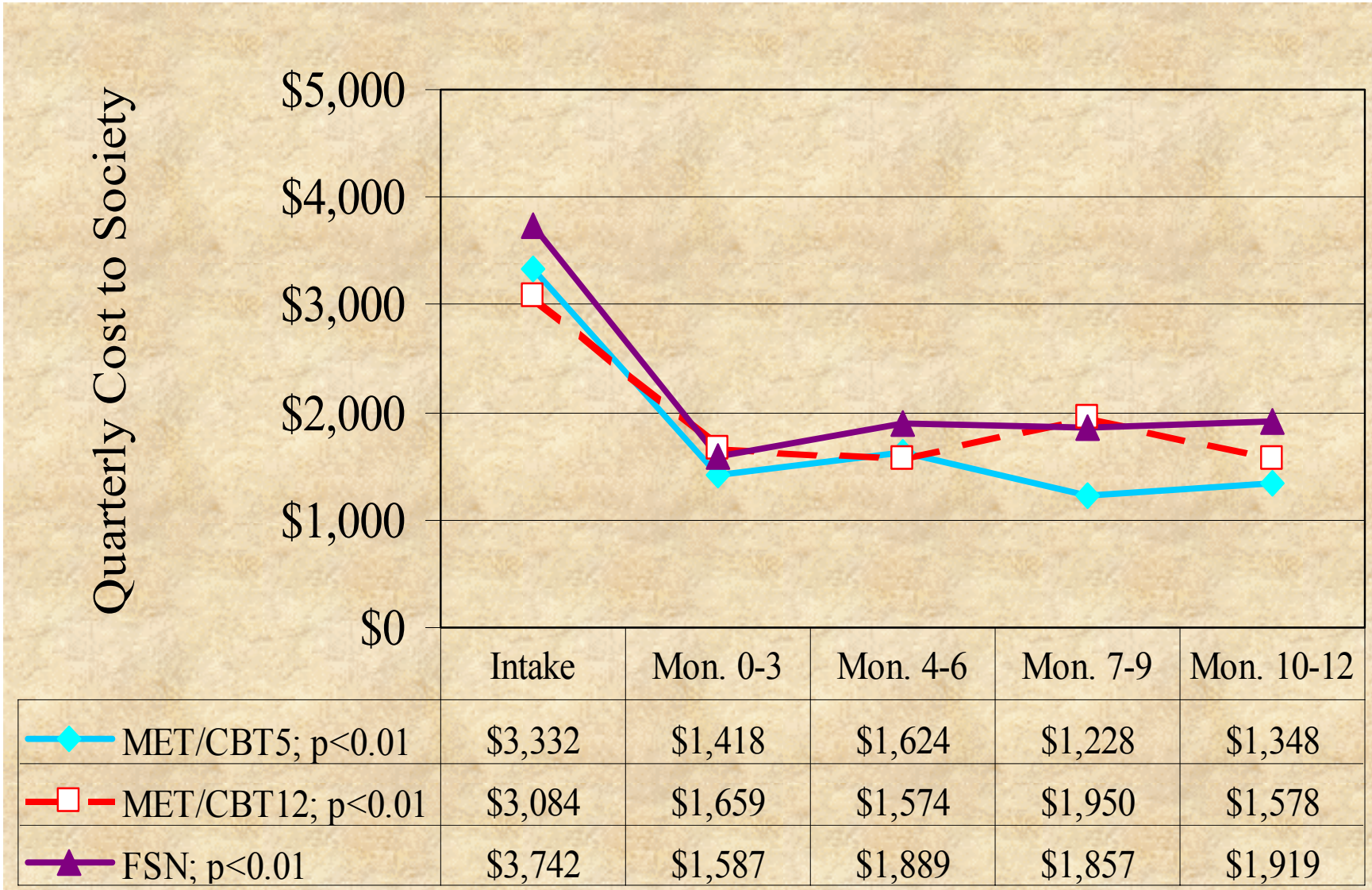
# Interaction Between Internal Distress and Dosage Condition



# Interaction of Temperament and Dosage Condition

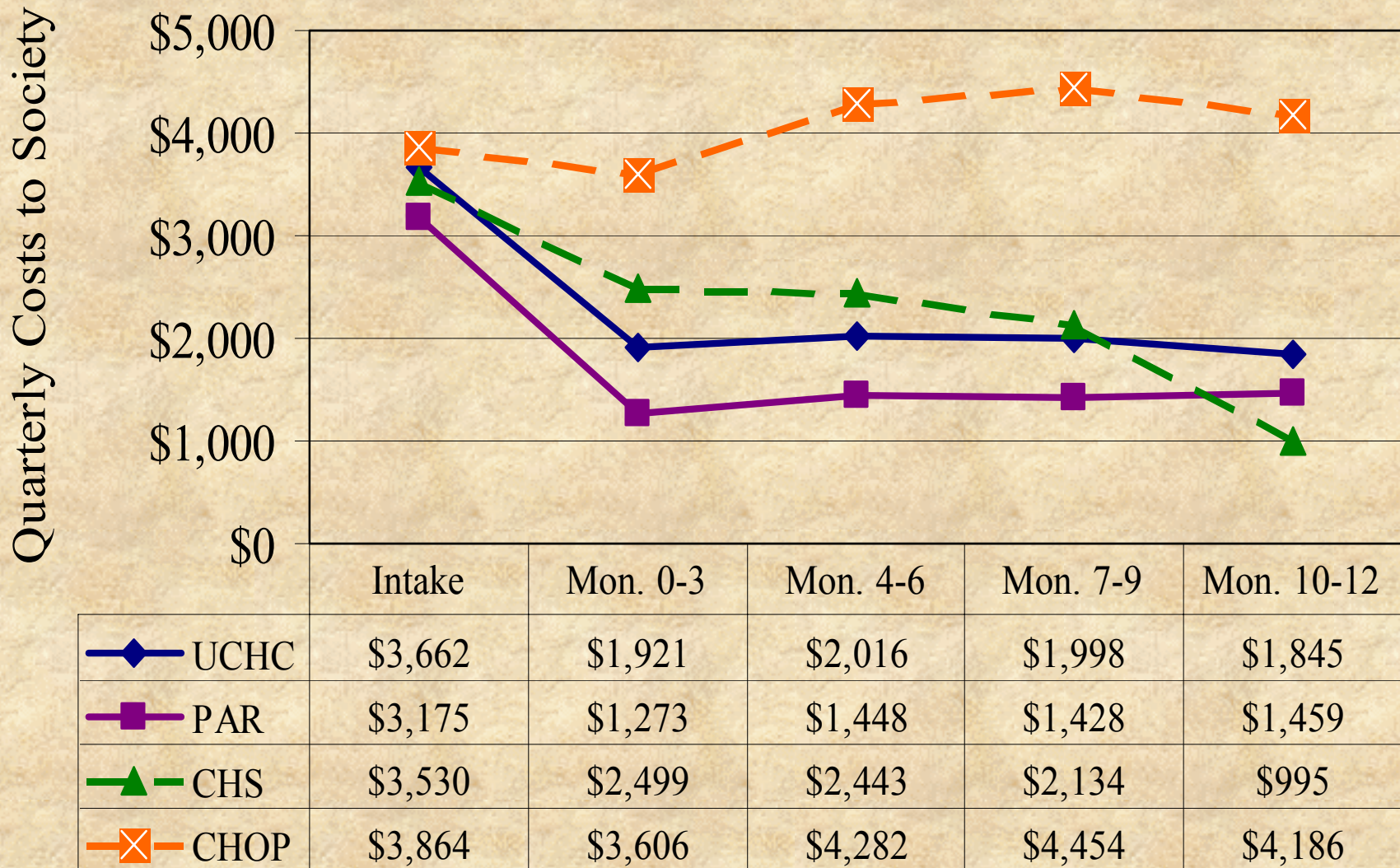


# Average Cost of Drug Abuse Consequences over Time by Condition: CYT Incremental Arm



Source: Cannabis Youth Treatment (CYT) study

# Average Cost of Drug Abuse Consequences over Time by CYT Site



Source: Cannabis Youth Treatment (CYT) study

# Summary of Key Points

- **Is more treatment or time in treatment better?**  
Not necessarily. The brief intervention held its own overall and is sufficient for many. However, there is evidence that it matters as the severity goes up.
- **Does the type of treatment matter?** Again, in general it does not appear to matter a lot. However, for more severe clients there was some evidence that the more intensive or family approaches did a little better. Conversely, therapists in the MET/CBT5 condition complained about a lack of guidance on how to work with families who did want to get involved.

# Key points- continued

---

- **How do you know this is not just regression to the mean?** Because the natural course is to continue, and many existing treatments and minimal treatment conditions have little effect on cannabis use.
- **Is this Feasible for regular programs?** Yes, the average costs are similar to program directors reports, many of the staff were regular line therapists, and two of the four sites were existing community-based programs and continue to use the protocols.
- **Does treatment effect the other co-occurring problems reported by these adolescents?** Yes, it appears to reduce problems in a wide array of areas, though more work needs to be done on assessing the stability of the gains.

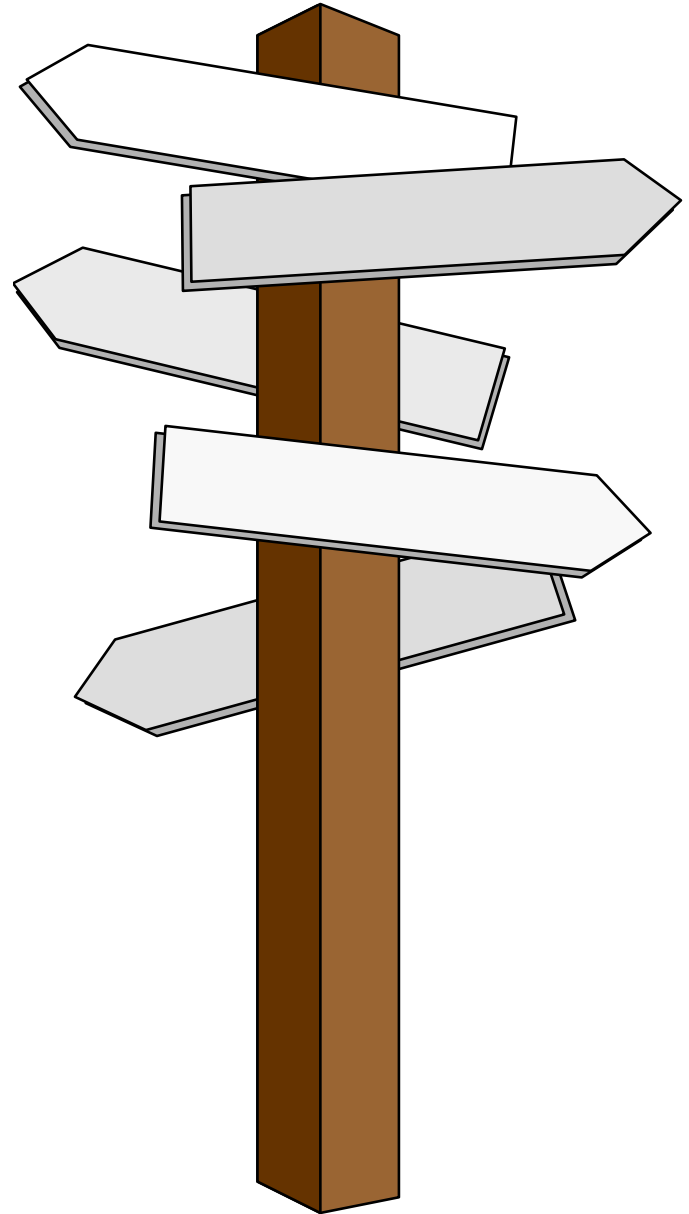
# Key points- continued

---

- **Is adolescent substance abuse treatment cost effective?** Yes, the cost of treatment was offset by reductions in the cost to society within 3 to 6 months.
- **Will everyone get the same outcomes?** No, there were major site differences in client characteristics, treatment participation, treatment costs, clinical outcomes, and changes in the cost to society.
- **Given the similarity of outcomes, why not just use the shortest/cheapest?** The catch is that two thirds of the CYT adolescents were still having trouble 12 months later – suggesting there is still much room for improvement.

# Part 5. Shifting to a Recovery Management Paradigm

---



# Why go beyond acute episodes of care?

---

- Substance use is a chronic relapsing condition that often requires multiple treatment episodes before an adolescent reaches recovery.
- Between 20% (outpatient) to 50% (other levels of care) of adolescents entering treatment have been in treatment before.
- After discharge from the initial outpatient treatment episode, over half of the adolescents are commonly transferred to another level of care, referred to more care or readmitted within 12 months.
- CYT demonstrated the effectiveness of 5 types of short (6-14 week) outpatient treatment, but over 2/3rds still needed more treatment.

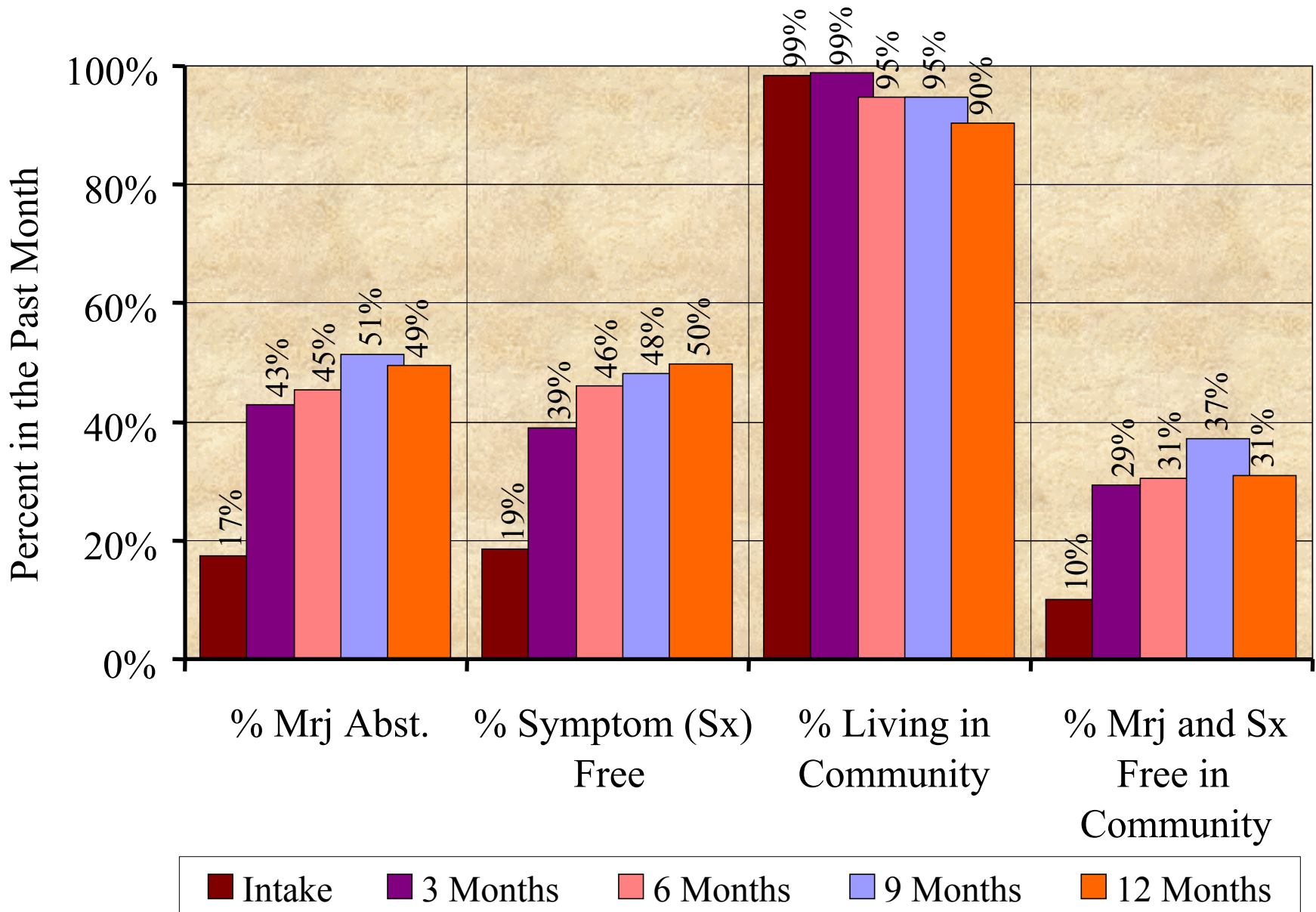
# A Definition of Recovery

---

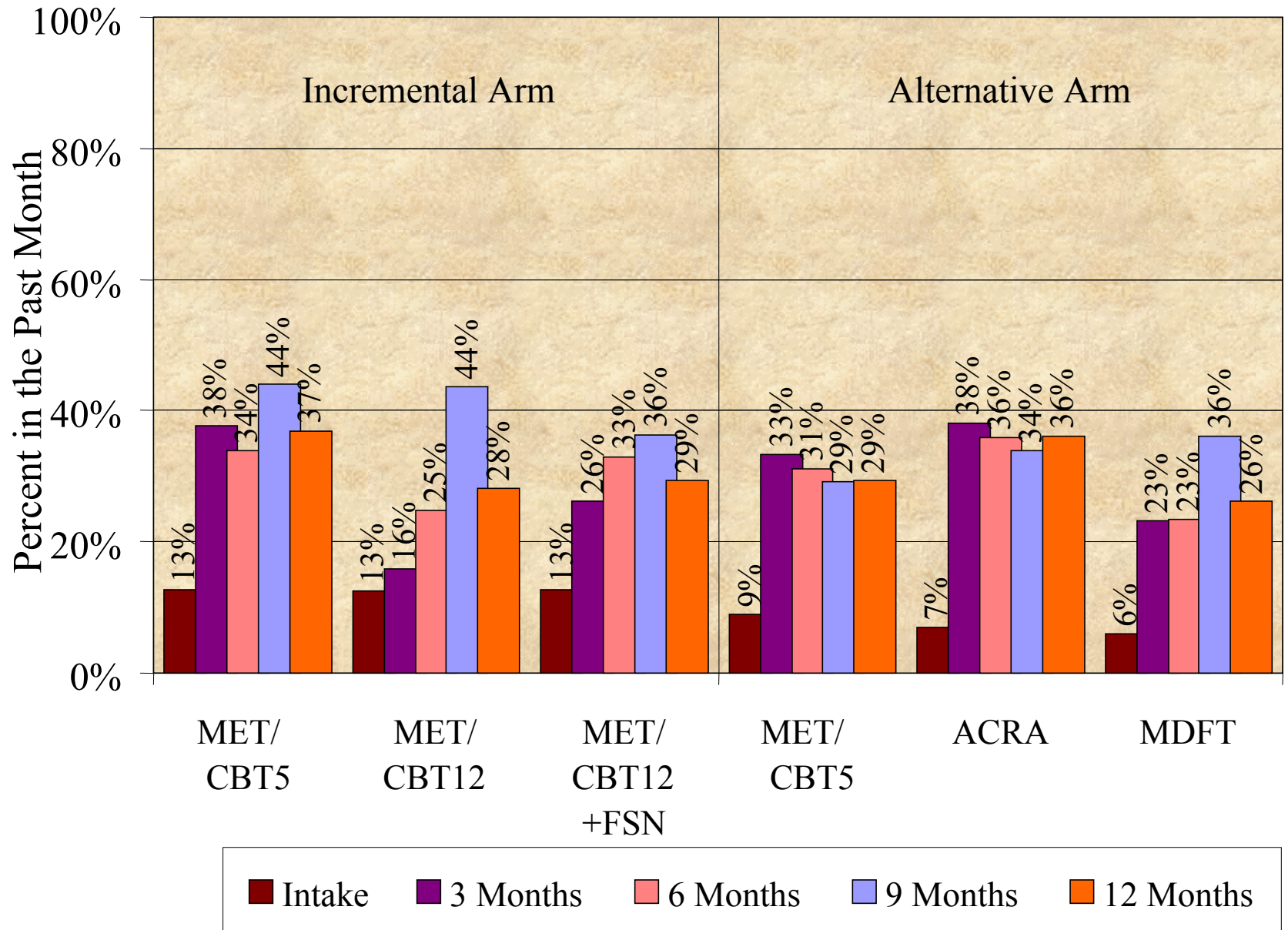
*“No Past Month cannabis use or substance related problems (from any substance) while living in the community”*

- Excludes people abstinent while in a controlled environment
- Can include people in treatment, self help, probation, or parole as long as they are living in the community

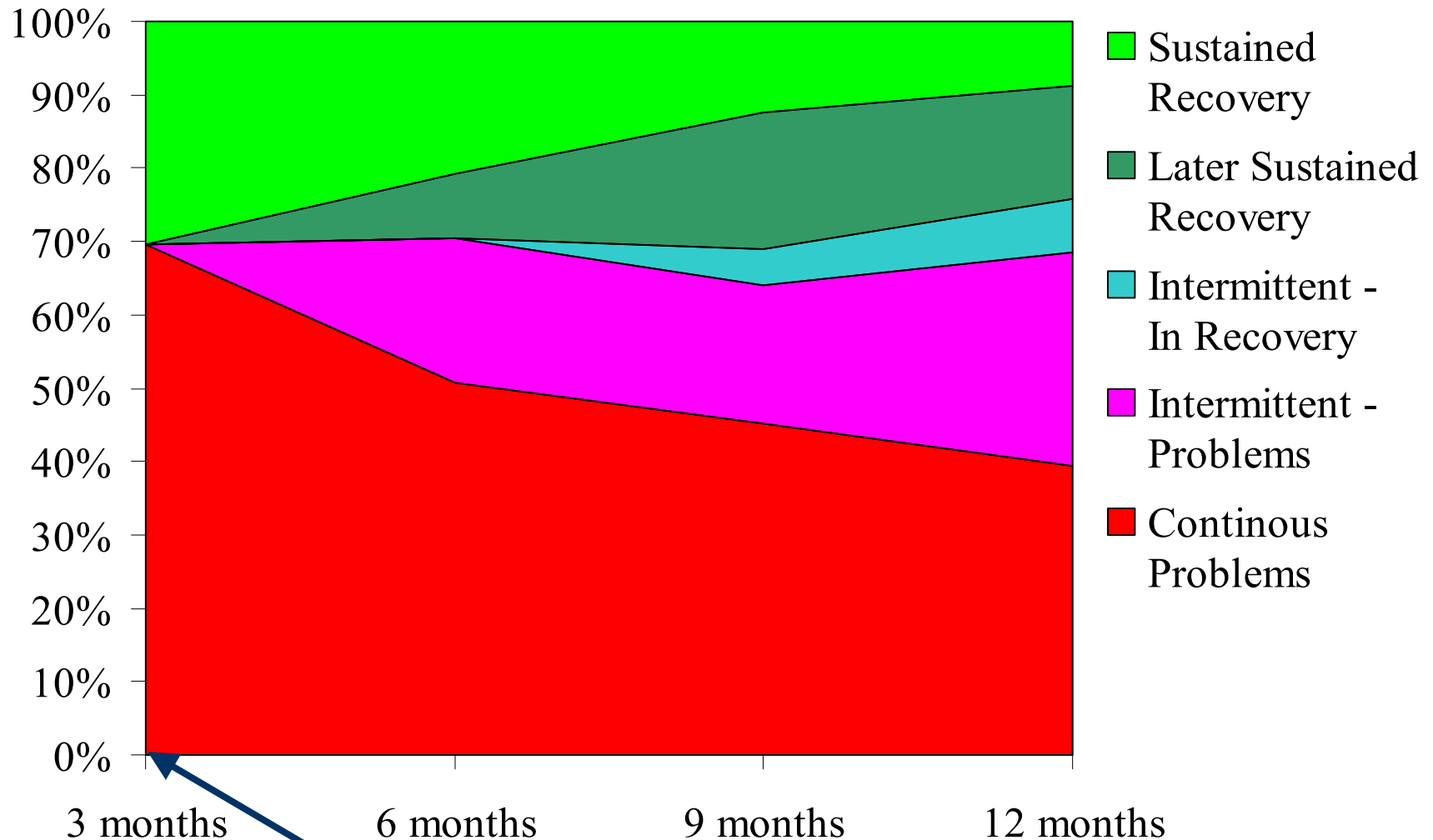
# Positive Impact of CYT on Recovery



# Recovery by Intervention and Arm

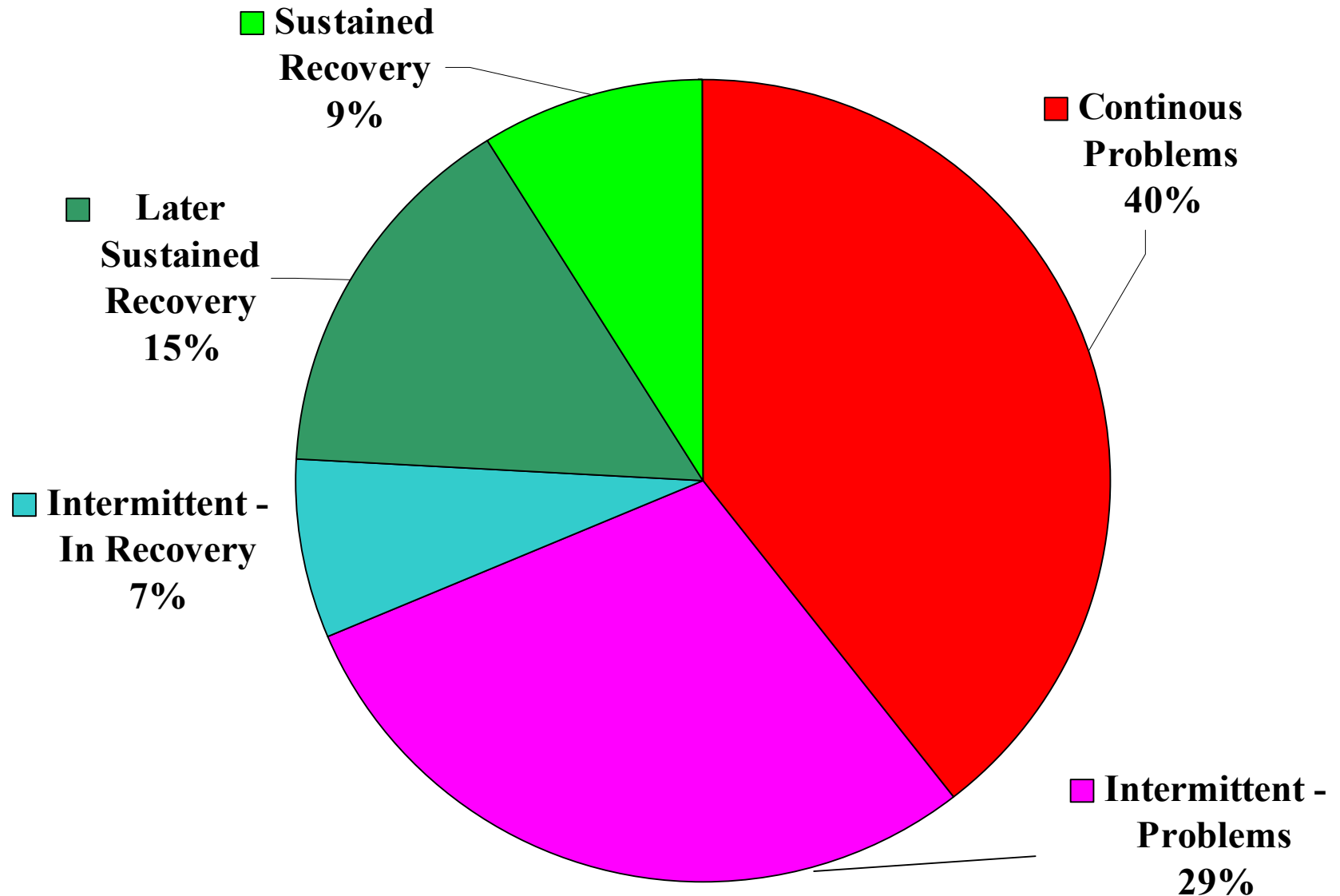


# Changes in Recovery After Treatment

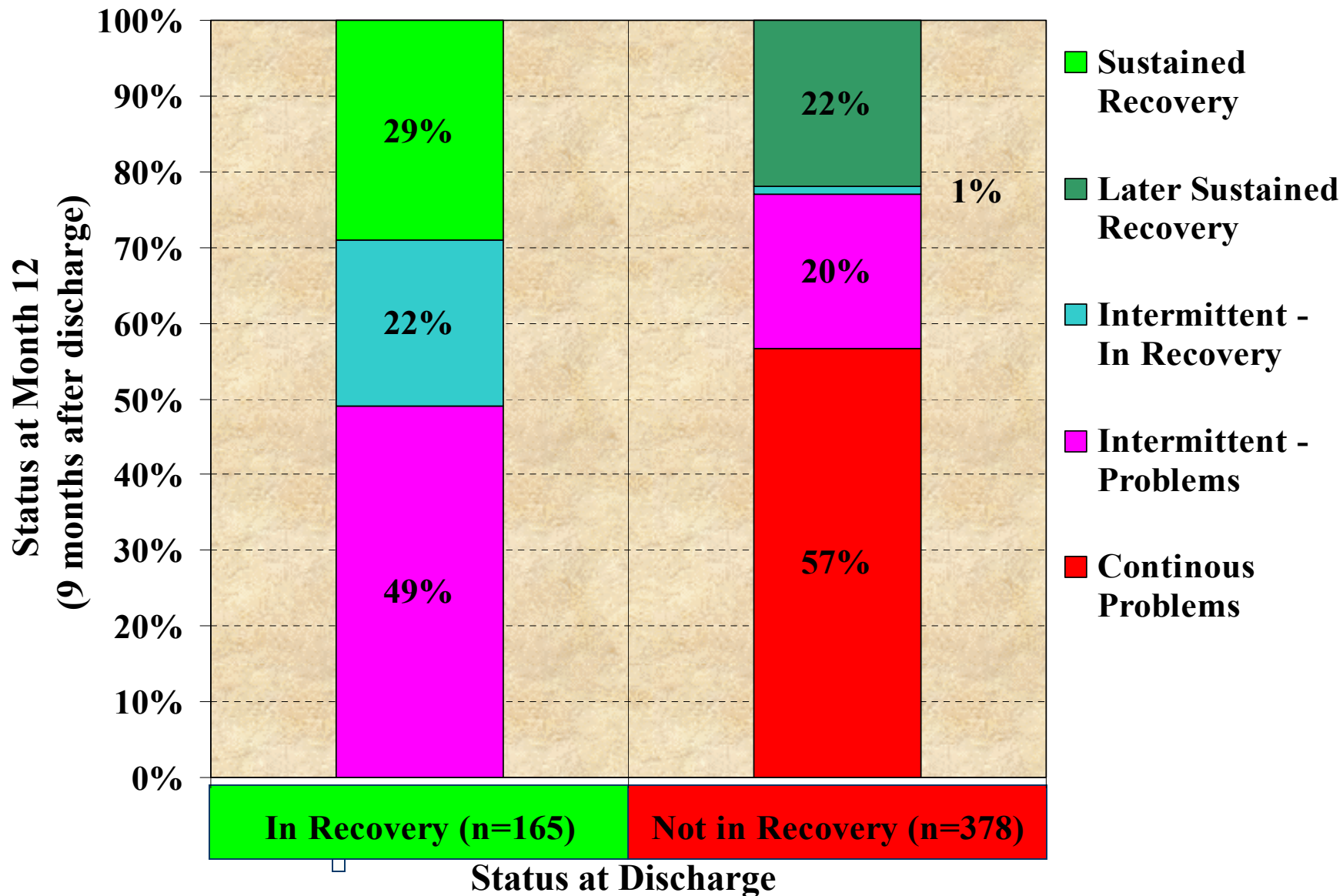


**Over 98% of CYT treatments Completed**

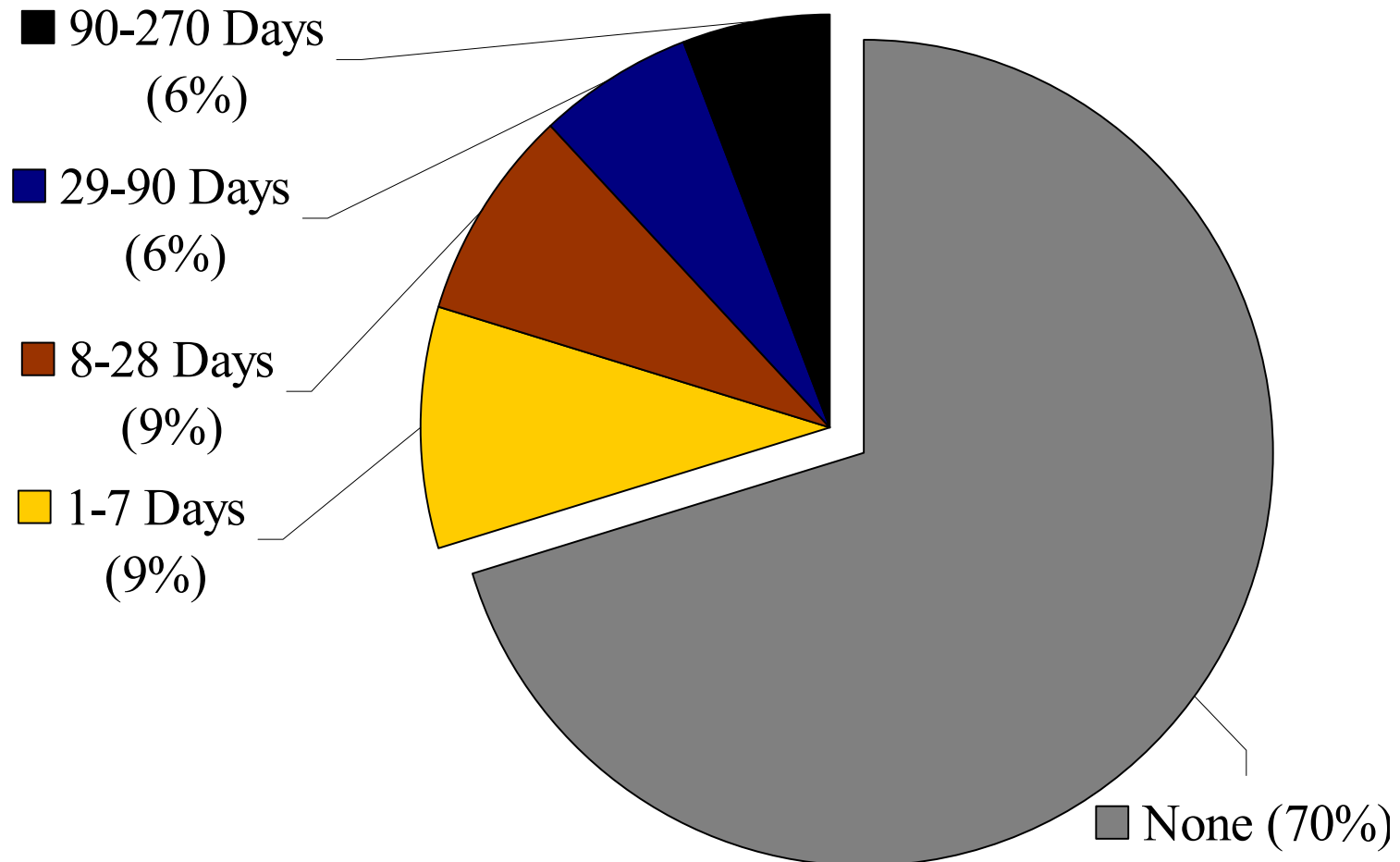
# Cumulative Recovery Pattern From Discharge to Month 12



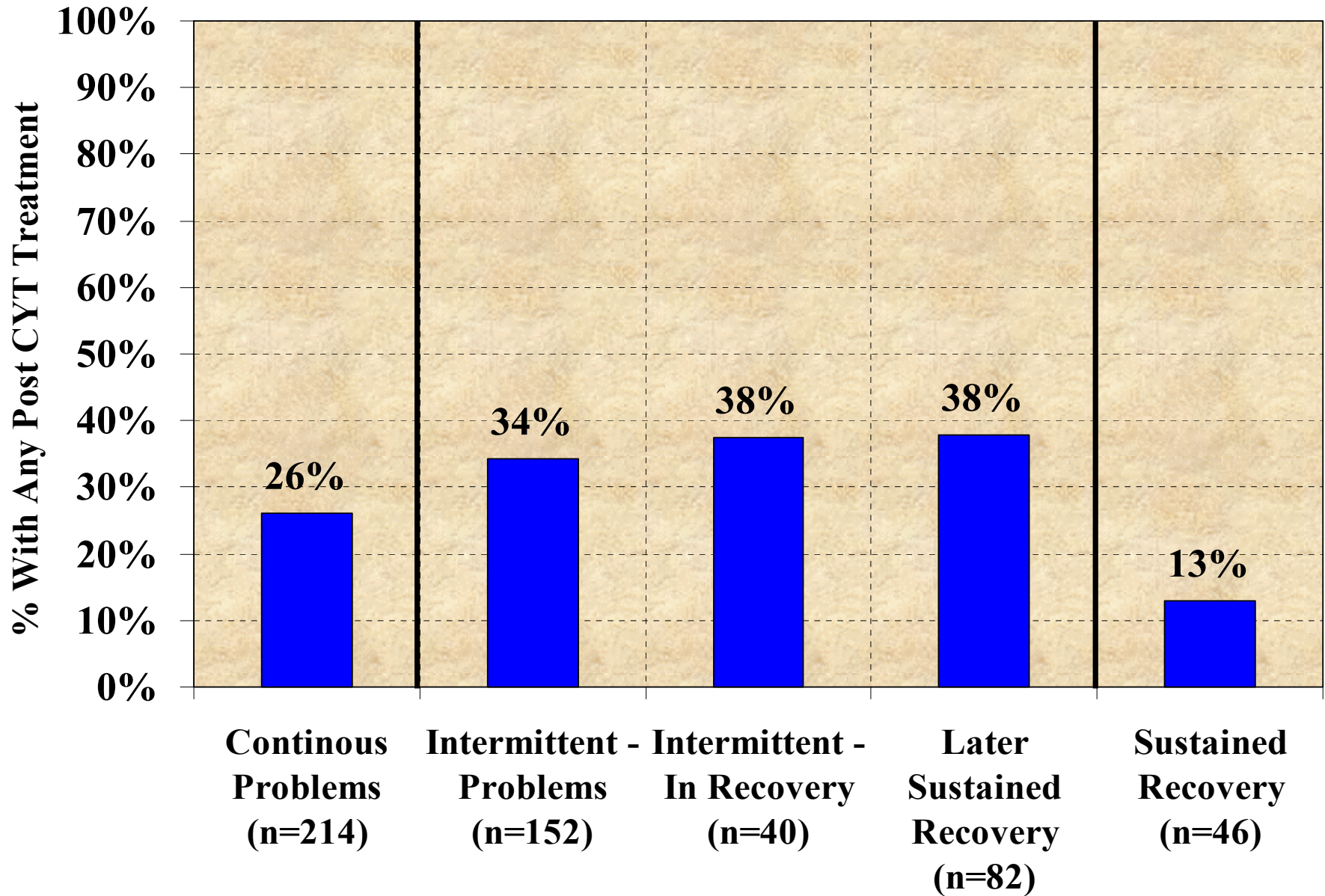
# The Outcomes of “a” Treatment Episode are Just a Step in the Long Road to Recovery



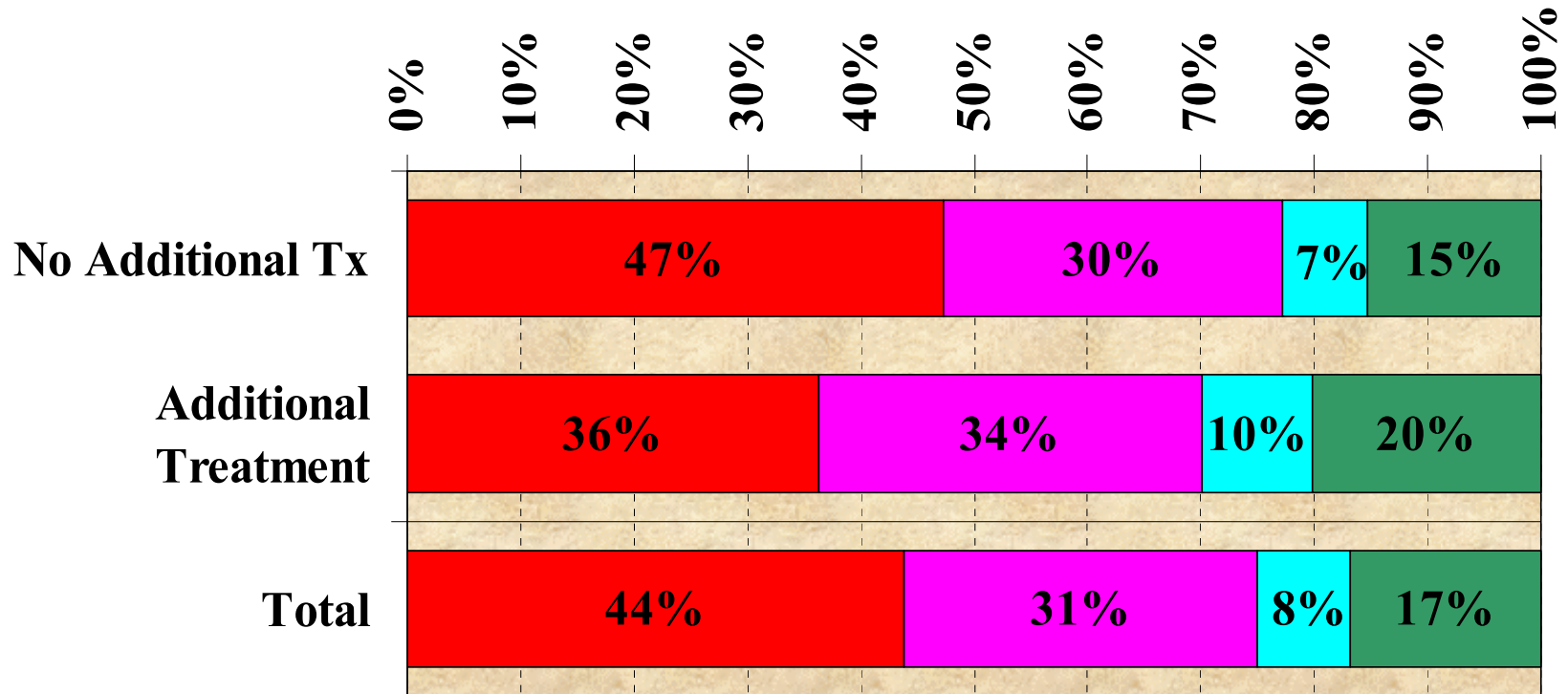
# Self-Reported Days of “Post-CYT” Substance Abuse Treatment



# Treatment by Recovery Status at Month 12



# The Outcomes of “a” Treatment Episode are just a Battle in the War of Recovery



OR: odds ratio of being in group if receiving additional treatment

- Continuous Problems (OR=0.73)
- Intermittent - Problems (OR=1.13)
- Intermittent - In Recovery (OR=1.21)
- Later Sustained Recovery (OR=1.25)

# Predicting 12 Month Outcomes

		Nagelkerke R Square	
		Post CYT Treatment	Recovery at Month 12
Variables in the Model			
1	Prior Tx, Weekly Mrj Use, 3+ problems	3%	1%
2	Female, Nonwhite, under 15	5%	4%
3	Severity (Above median on substance problems, internal distress, behavior problems, illegal activity/violence)	8%	5%
4	Other Risk Factors (Family history, tempermant, single parent)	8%	8%
5	Days in CYT Treatment	8%	8%
6	Initial Response to Treatment (recovery, days of use, problems)	11%	22%
7	Post CYT Treatment	--	22%
8	Simplified Model	10%	19%

# Odds Ratio of Simplified Prediction Models

	Any Subsequent Treatment	Recovery in Month 12	
Prior Treatment	1.84 *	--	
Weekly Marijuana Use	1.52	--	
Female	0.61	1.66 *	
Under Age 15	1.85 *	--	
Above Median Substance Problems	0.64	--	
Above Median Behavior Problems	1.72 *	--	
Family History of SA Problems	--	0.56 *	
Response to Treatment (per symptom at discharge)	1.11 *	--	
Response to Treatment (per day of Mrj Use at discharge)	--	0.98 *	
Response to Treatment (in recovery at discharge)	--	2.43 *	
Per Day of Post CYT Treatment	--	1.00 *	
* p<.05			

# Reprise

---

- Recovery is a dynamic state that changes over time in both directions.
- The 3-month outcomes were related to the 12-month outcome, but only partially so.
- Over a third of CYT clients received additional treatment during the rest of the year and this was associated with being in the better outcome groups.
- Attempts to predict who gets subsequent treatment or outcomes worked, but still only predict 10-19% of the variance in 12-month outcomes.

## Part 5. Now What?

---

So what does all this  
mean for me?



# Implications

---

- We are entering a renaissance of new knowledge about adolescent substance abuse treatment.
- Treatment capacity is growing but we are only reaching 1 of 10 adolescents with substance use disorders.
- Many funders (CSAT, NIAAA, NIDA, RWJ) are interested in supporting further growth to help stem the current tide of substance use.
- Comorbidity and developmental issues are the norm
- Manual guided therapies that have been adapted to adolescents and implemented well can help improve the effectiveness of treatment.
- While a good start, the CYT interventions were not an adequate dose of treatment for the majority of adolescents.

# Implications

---

- We need to move beyond acute episodes of care to a recovery management paradigm.
- Adolescents who need and receive additional treatment appear to be doing much better than those who do not.
- It is very difficult to predict exactly who will relapse so it is essential to conduct aftercare monitoring with all adolescents.
- Only a fraction of those in need of more treatment received it, so there is a need for mechanisms to facilitate re-entry and support for providing these additional services.

# Contact Information



**Michael L. Dennis, Ph.D., CYT Coordinating Center PI**

Lighthouse Institute, Chestnut Health Systems

720 West Chestnut, Bloomington, IL 61701

Phone: (309) 827-6026, Fax: (309) 829-4661

E-Mail: [Mdennis@Chestnut.Org](mailto:Mdennis@Chestnut.Org)

**Manuals and Additional Information are Available at:**

CYT: [www.chestnut.org/li/cyt/findings](http://www.chestnut.org/li/cyt/findings)

NCADI: [www.health.org/govpubs/bkd384/](http://www.health.org/govpubs/bkd384/)

PETSA: [www.samhsa.gov/centers/csat/csat.html](http://www.samhsa.gov/centers/csat/csat.html)

(then select PETS from program resources)