Long-term Course of Drug Addiction & Recovery: Examples of CALDAR Studies

Yih-Ing Hser, Ph.D.

Center for Advancing Longitudinal Drug Abuse Research (CALDAR)

UCLA Integrated Substance Abuse Programs

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CALDAR

Increase knowledge of patterns of drug addiction & their interplay with treatment and other service systems

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Enhance scientific collaboration through integrated analysis, training, consultation, dissemination

Funded by NIDA (P30 DA016383) since 2005 with adm, research, and stat cores.

Life Course Perspective

1. Life course theory recognizes the importance of time, timing, and temporal processes in the study of human behavior and experience over the life span, characterized by **trajectories**, **transitions**, and **turning points**
2. Persistence of drug use resembles chronic diseases: high relapse rates, non-compliance, requires long-term care/management
3. Critical life events often lead to or explain changes
4. Social capital, situated choice are additional key concepts

Long-term Follow-up Studies: A Few Examples

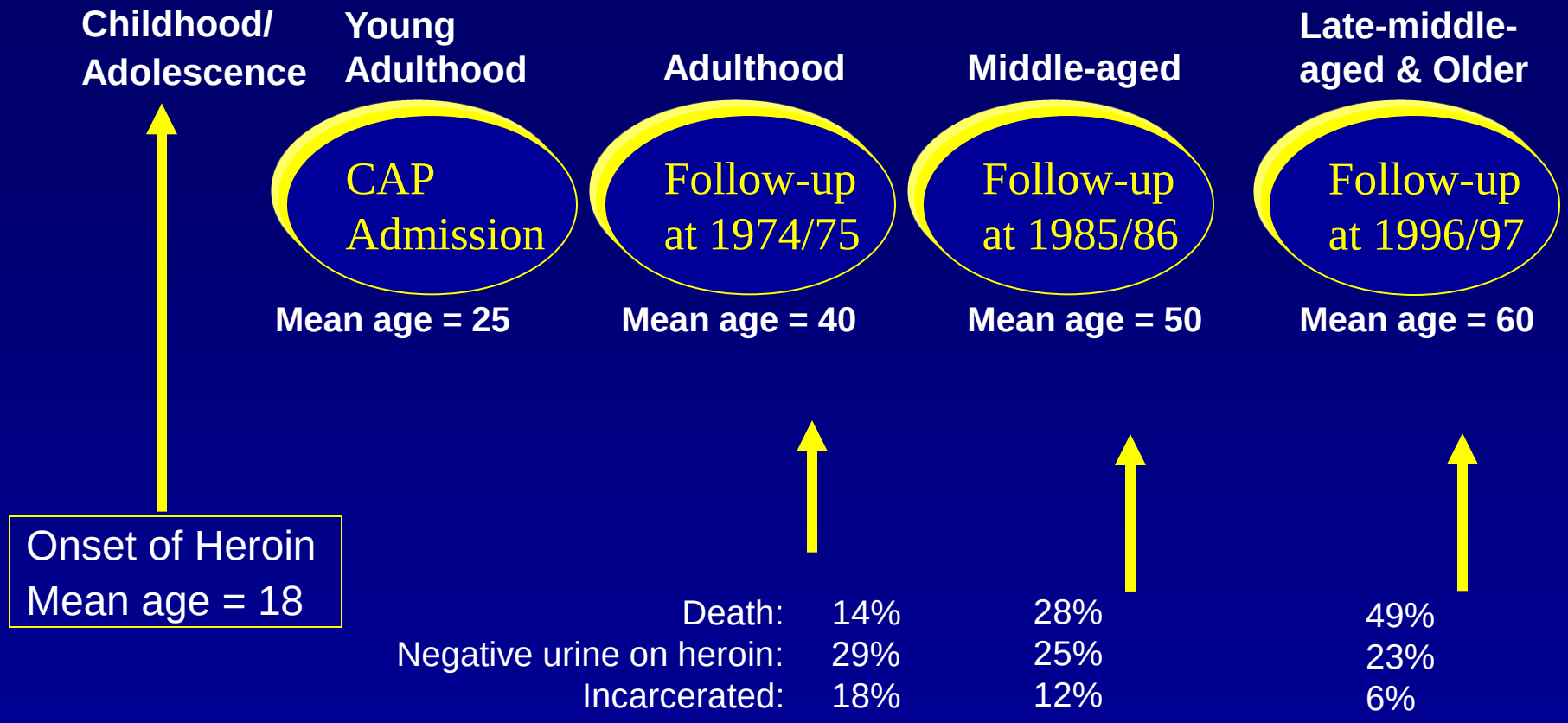
1. 33-year follow-up study of heroin addicts
2. 25-year follow-up of methadone patients
3. 12-year follow-up of a cocaine-dependent sample
4. 5-year follow-up of participants at a therapeutic community
5. 8- and 13-year follow-up of a methamphetamine sample
6. 10-year follow-up of mothers & their children
7. 5-year follow-up of opioid patients randomized to buprenorphine vs. methadone – CTN Starting Treatment with Agonist Replacement Therapy (START)

Selected CALDAR Studies

- 33-year Follow-up Study of Heroin Addicts
- Comparisons between heroin, cocaine, and methamphetamine use trajectories
- fMRI on recovery from cocaine dependence

33-year Follow-up Study of Heroin Addicts

Life Course of Heroin Addiction

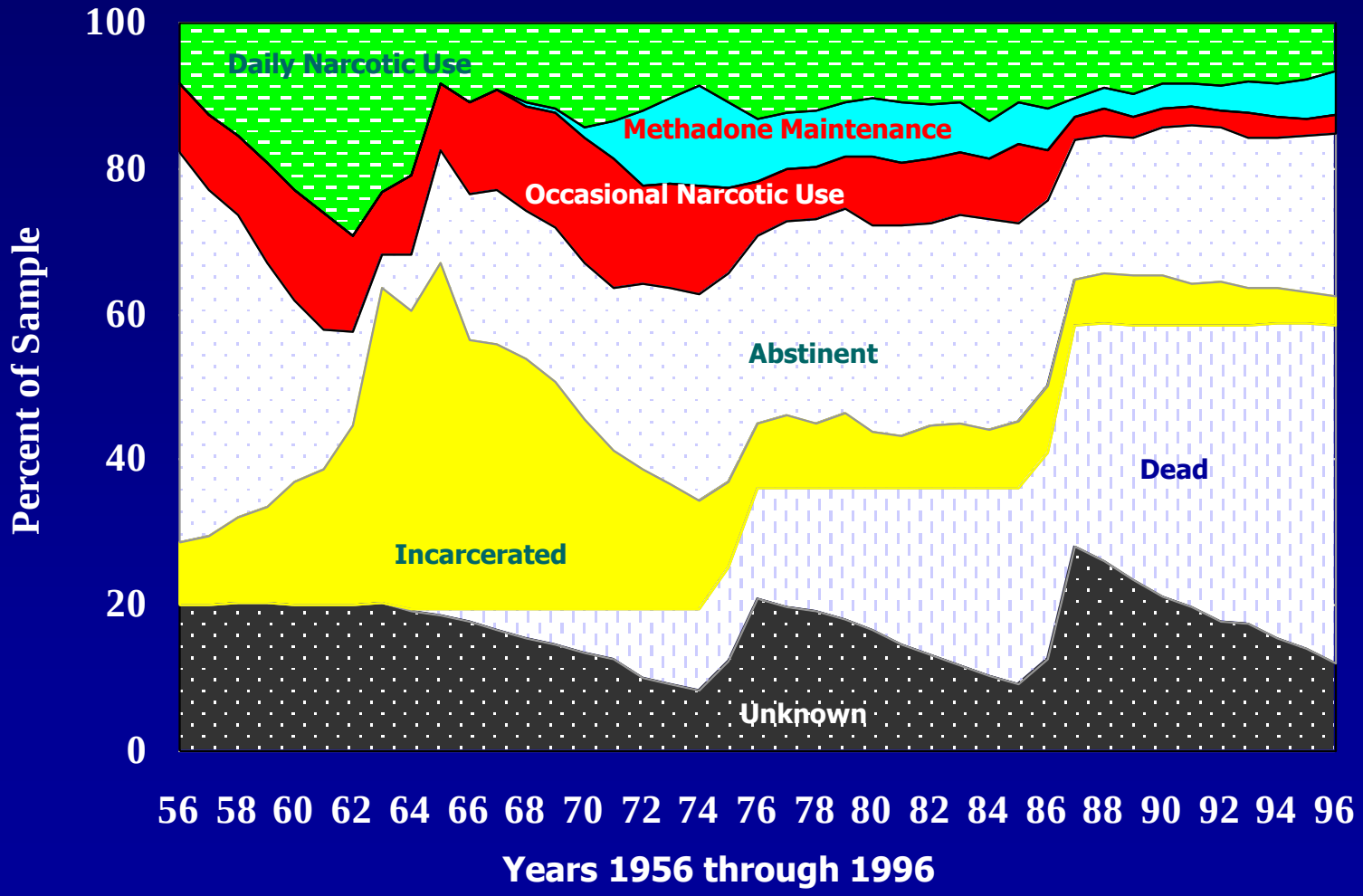


Influencing Factors

- Larger society/environment
- Drug itself
- Individual: social relationship (family, school, church), education/employment, institutional interaction (CJS, treatment), health/mental health

The Natural History of Narcotics Addiction Among CAP Sample

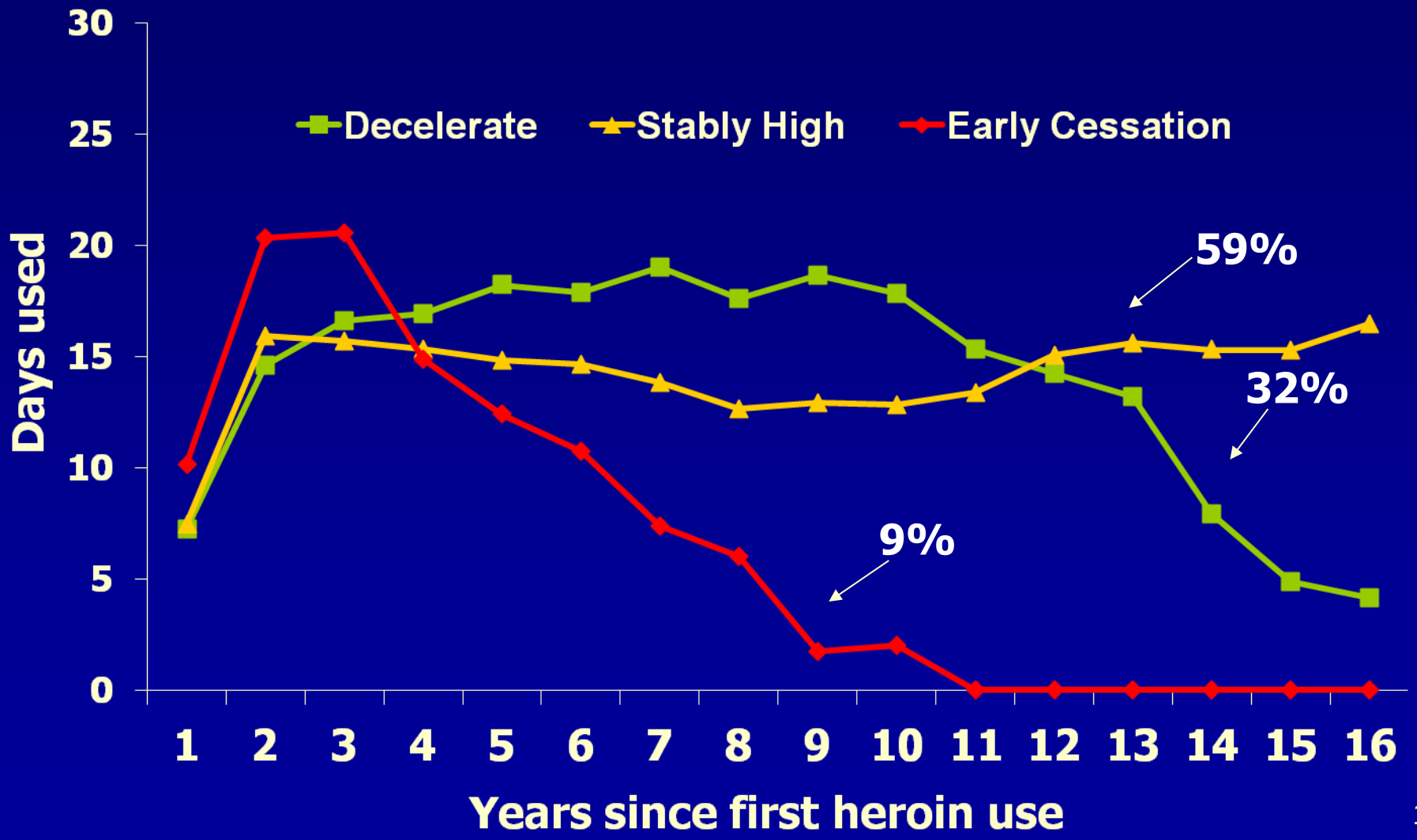
(N=581)



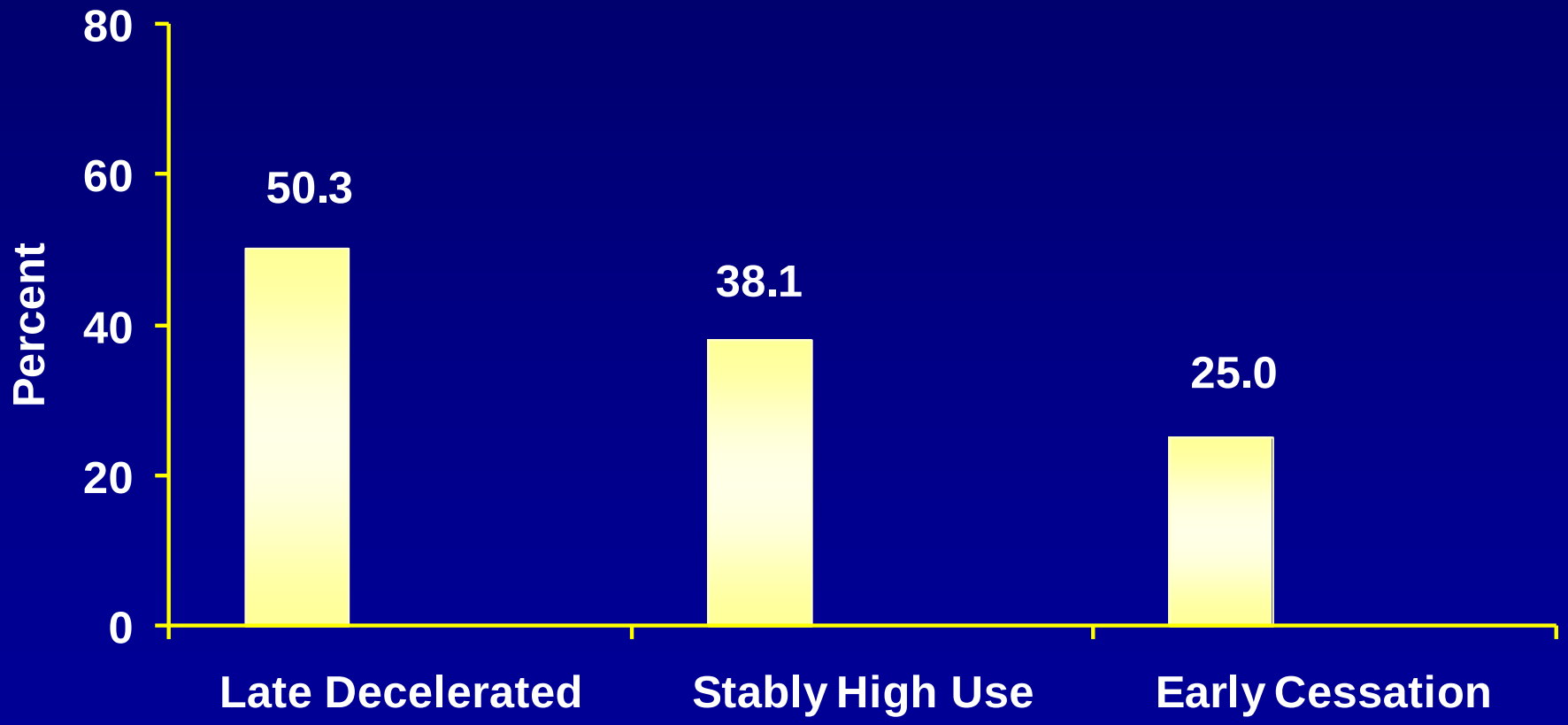
Identify Groups with Distinctive Heroin Use Trajectories

- Growth Mixture Modeling
  - First half of the observation (16 years) since heroin initiation
  - Two-part model (skewness)
  - Linear and quadratic terms
- Three Distinctive Groups
  - Standard statistical criteria: BIC, entropy

Mean Number of Days Per Month Using Heroin, 33 Year Follow-up



Differences in Trajectory Groups: Mortality



Major Findings on Addiction

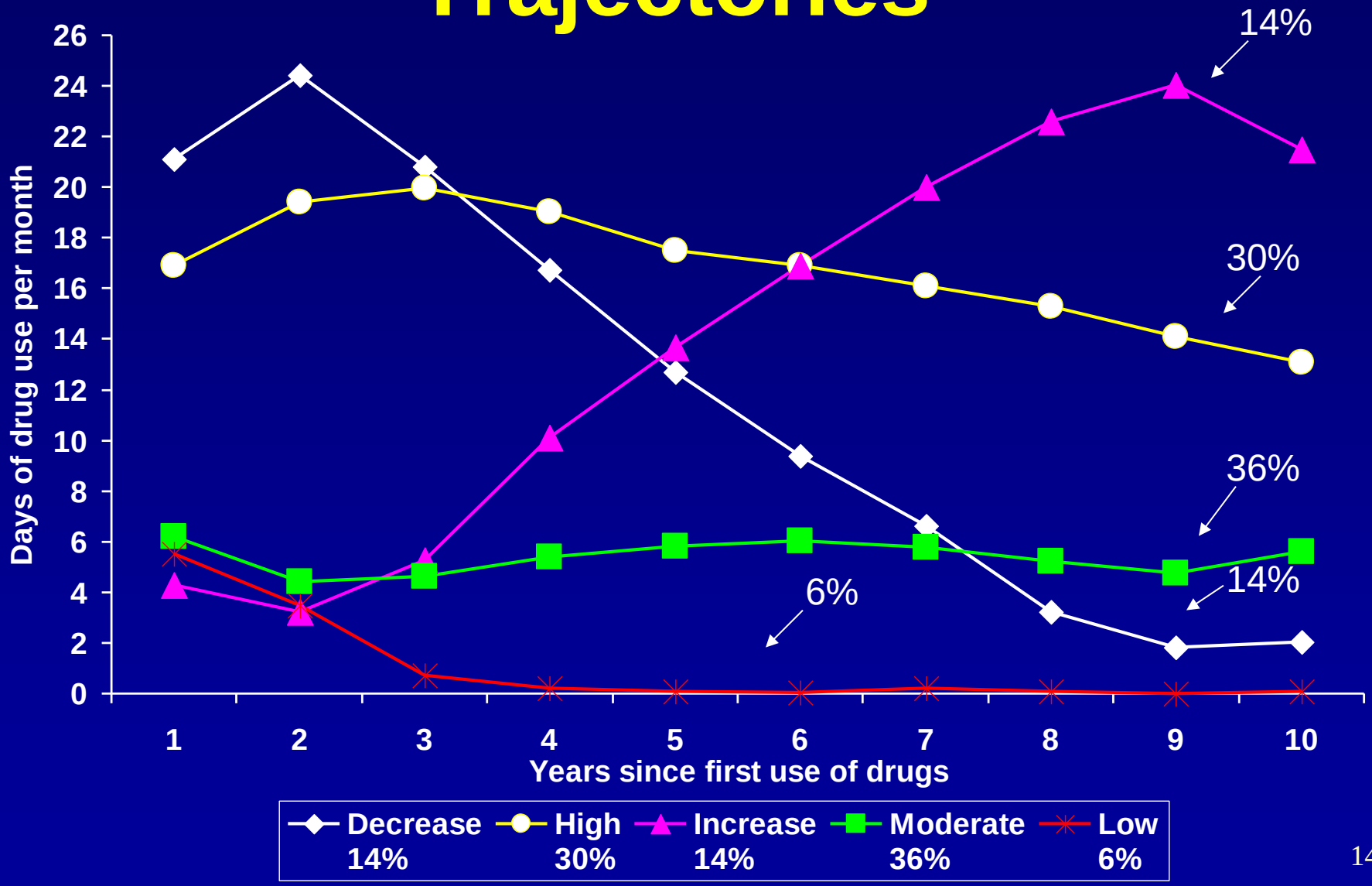
- Opioid addiction is a chronic relapsing condition
- High mortality and other adverse consequences

Comparing Use Trajectories by Drug Type

- Natural history interviews with 1,797 participants
- 35% heroin, 39% cocaine, 26% meth

1. The 33-Year Heroin Follow-up Study (n=472)
2. The 12-year Cocaine Follow-up Study (n=319)
3. The Meth Natural History Study (n=350)
4. Treatment Process Study (n=391)
5. Treatment Utilization and Effectiveness Study (n=265)

Five Distinctive Drug Use Trajectories

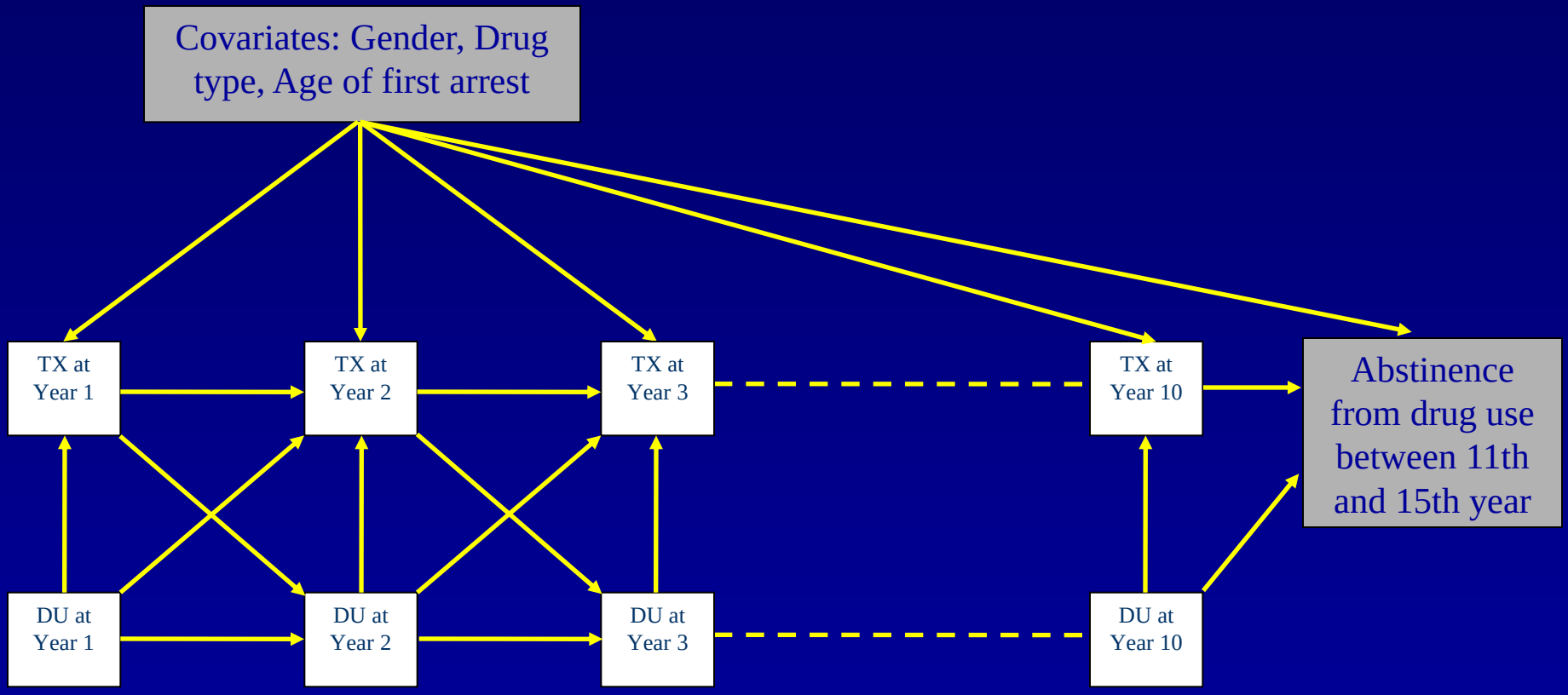


Systems Experiences and Drug Use in 10 Years Following First Primary Drug Use

	Early Treatment (n=61)	Late Treatment (n=60)	No Treatment (n=326)
Cumulative months of:			
Drug treatment, Mean (SD)**	15.1 (16.5)	5.6 (7.5)	0.0 (0.0)
Incarceration, Mean (SD)	11.3 (17.6)	8.8 (19.4)	10.4 (20.6)
Employment, Mean (SD)*	47.3 (41.4)	39.4 (35.5)	54.0 (43.3)
Primary drug use, Mean (SD)	76.6 (34.1)	77.6 (35.7)	72.9 (40.3)

* $p < .05$, ** $p<0.01$

Cumulative Treatment Effect
(Marginal structural model analysis)



Abstinence between 11th and 15th year is significantly predicted by the treatments accumulated from Year 1 to Year 10

Major Findings on Addiction

Over a 10-year period following first use of heroin, cocaine, & meth:

- **Long periods of heavy use persist**
- **Users are more exposed to the criminal justice system than to treatment**
- **Few users receive treatment (about 25%) during the 10 years**
- **Cumulative treatment effects**
- **Heroin, cocaine, and meth users do not typically "switch" primary use to another of these drugs. Use of alcohol and marijuana continue among all primary drug use groups**

What Else Have We Learned?

- Long-term observation is necessary to explicate addiction patterns and trajectories. Otherwise, we may miss the critical points or differences as well as opportunities for intervening
- Given addiction is a chronic disease and cumulative treatment effect exists, long-term care makes sense

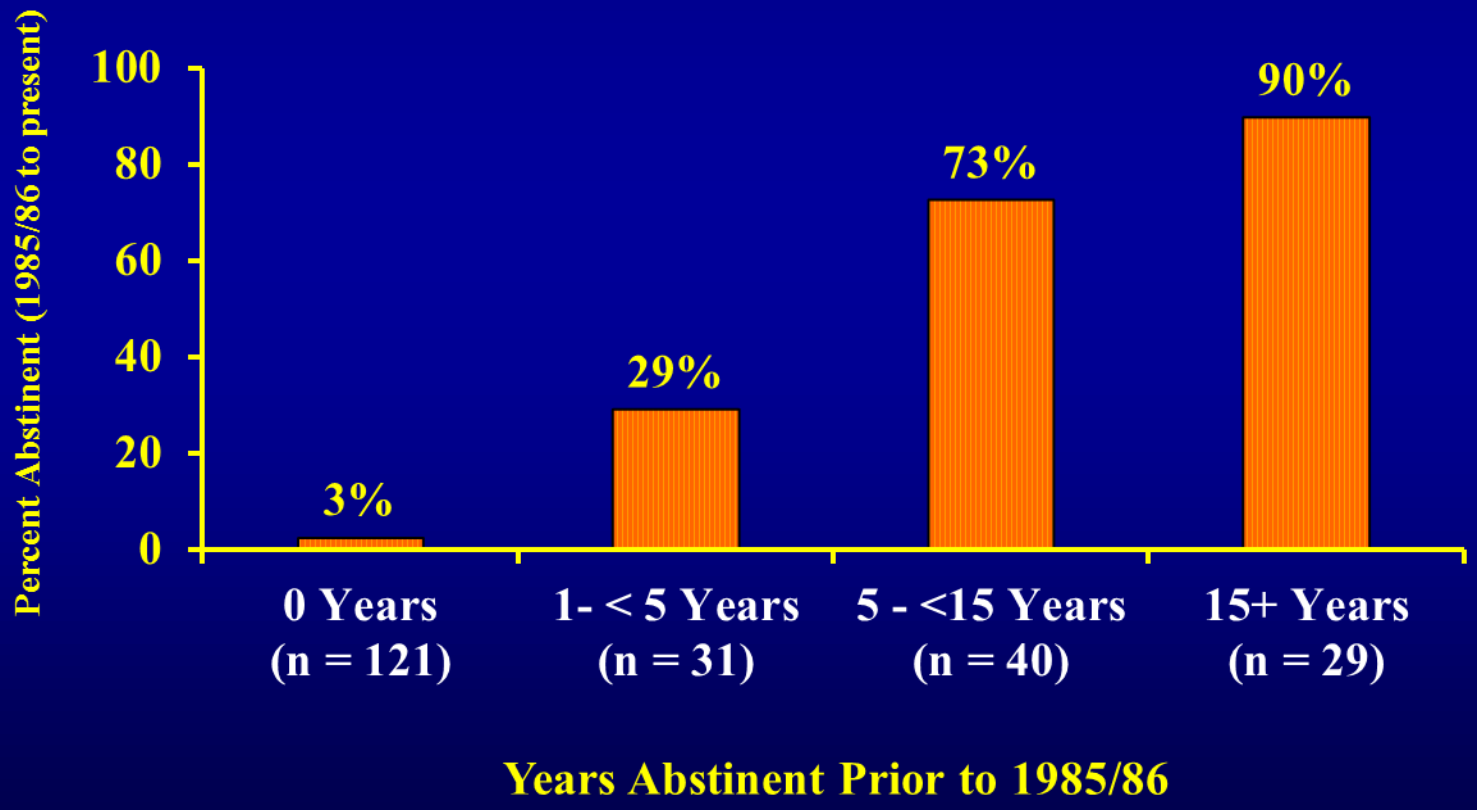
Opioid addiction is a chronic relapsing condition

Is stable long-term recovery possible?

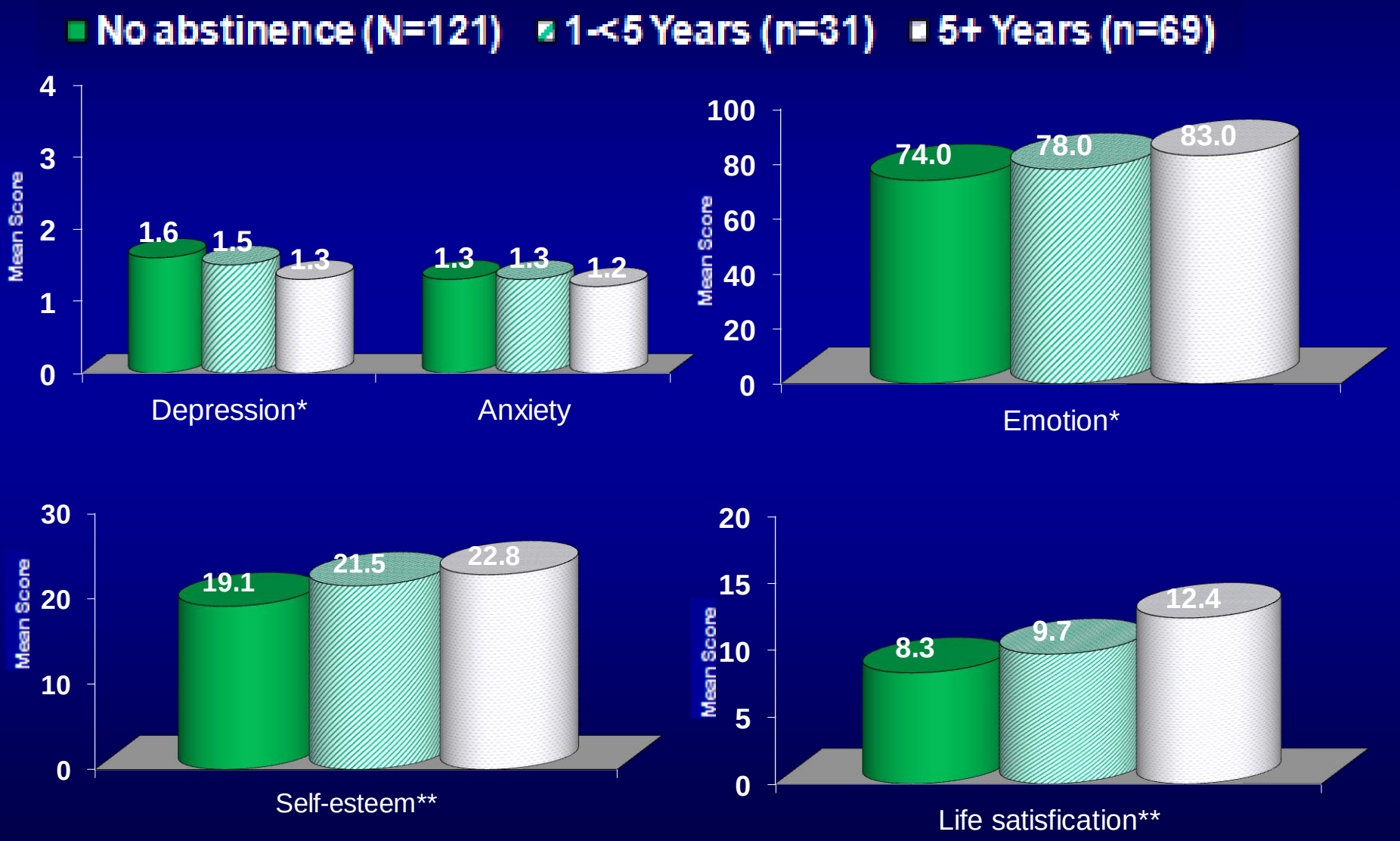
Recovery

- Duration
  - Is there a critical threshold?
- Dimension
  - Abstinence
  - Incarceration
  - Others

Longer Time in Abstinence (prior to 1985/86) Highly Associated with Abstinence in the Next Ten Years

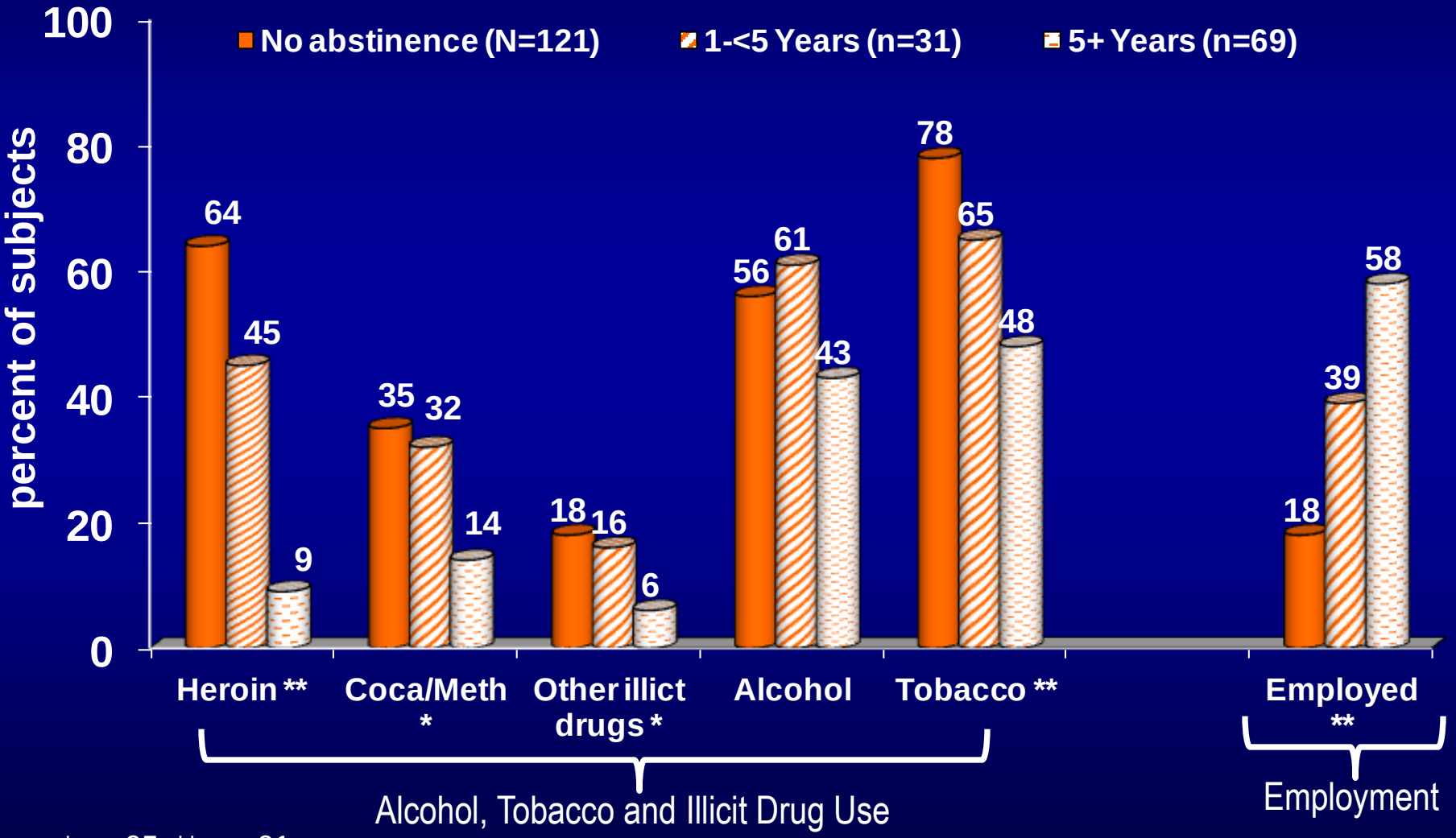


More than 5 Years of Abstinence:
Predicting Lower Depression, Better Emotional Well-being, Higher Self-esteem and Life Satisfaction



* p<.05; **p < .01

Alcohol, Tobacco, Illicit Drug Use, and Employment at the 33-year Follow-up (N = 221)



* p<.05; **p < .01

Major Points

- Five years appear to be a good benchmark
  - Less future use
  - Less CJS involvement
  - Better emotional and social functioning
  - Alcohol and tobacco still problematic
- Need to
  - Understand the underlying mechanisms
  - Promote recovery in early stages of addiction

fMRI for Recovery from Cocaine Dependence: Preliminary Findings

Participants

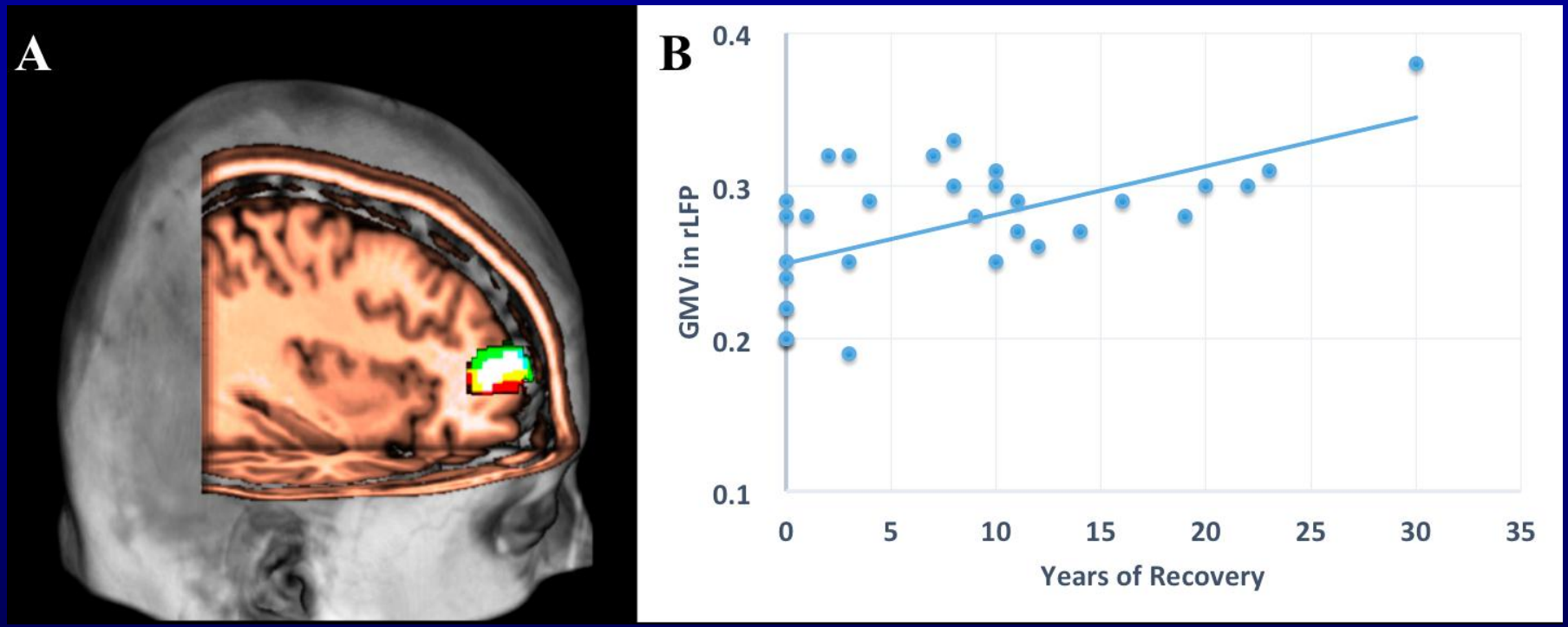
- 40 adult men (M=56.5 ± 5.4 years)
- Participants were categorized into 4 groups based on date of last use
  - Use within past year (n=10)
  - 1-5 years abstinent (n=5)
  - 6-10 years abstinent (n=6)
  - 10+ years abstinent (n=12)
- 7 age-matched healthy controls

Data Collection

- Structural Data
- Diffusion Tension Imager (DTI) Data
- Resting State Data
- Cue Task
- Cups Task

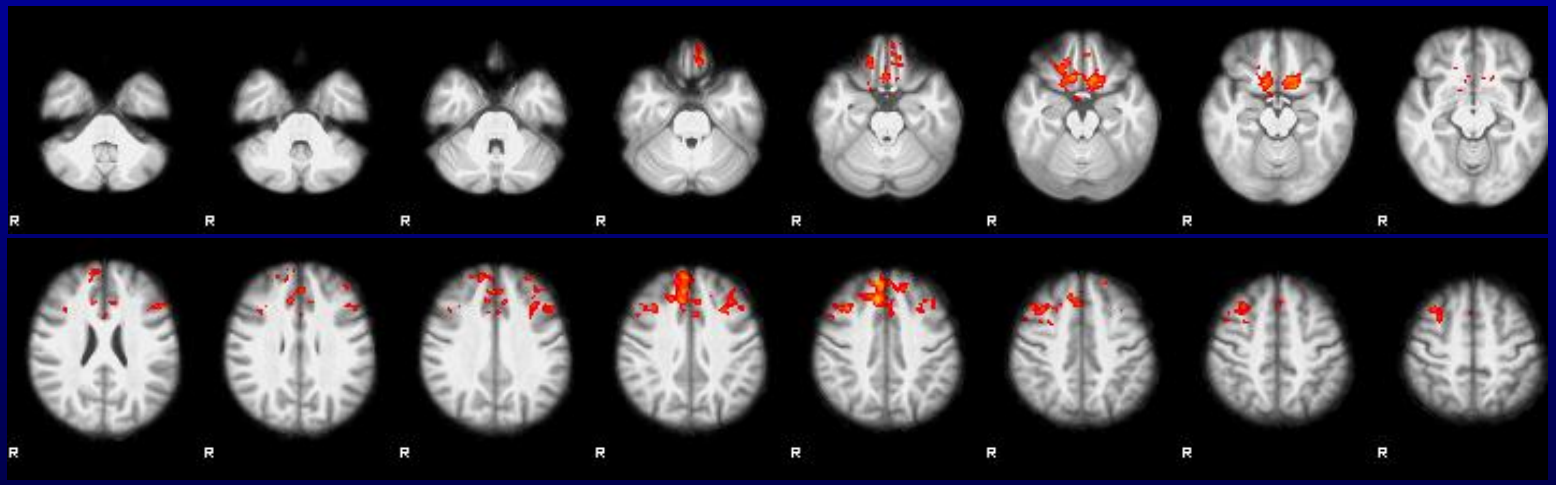
Preliminary Findings on Structural Changes

Results revealed that increasing years of abstinence was associated with increased Grey Matter Volume (GMV) in the right lateral prefrontal cortex (A), a region important for inhibition control.



Preliminary Findings on Functional Changes

- When viewing cocaine-related pictures, cocaine addicts regardless of their length of abstinence, showed comparable higher activation in ventromedial prefrontal cortex (top panel) as controls.
- In contrast, the controls showed more anterior cingulate cortex (bottom panel) activation than current users. And the activation increased with years of abstinence.



Other Selected Findings on Recovery

1. Developmental timing of first drug treatment
2. Youth prefer that recovery programs be focused on promoting lifestyle change through wellness
3. Effects of maternal drug use on children
4. Perceived neighborhood safety related to long-term recovery
5. Few evidence-based recovery support services available in California

Application of Evidence-based Intervention to Reduce Relapse

- Incorporating behavioral interventions in methadone maintenance treatment
  - Contingency management or motivational incentive intervention

- Linking compulsory rehab to community treatment and other services
  - Transitional case management or recovery management intervention

Contingency Management Study in China

- **Two study sites: Shanghai, Kunming**
- **RCT to two study conditions: CM vs. TAU**
- **N=320, 12 weeks trial**
- **Target Behaviors**
  - **MMT clinic attendance**
  - **Negative urine testing result**
- **Reward Schedule**
  - **Escalating rewards**
  - **Two separate tracks for the two target behaviors**

Contingency Management

MMT retention improved in CM in Kunming

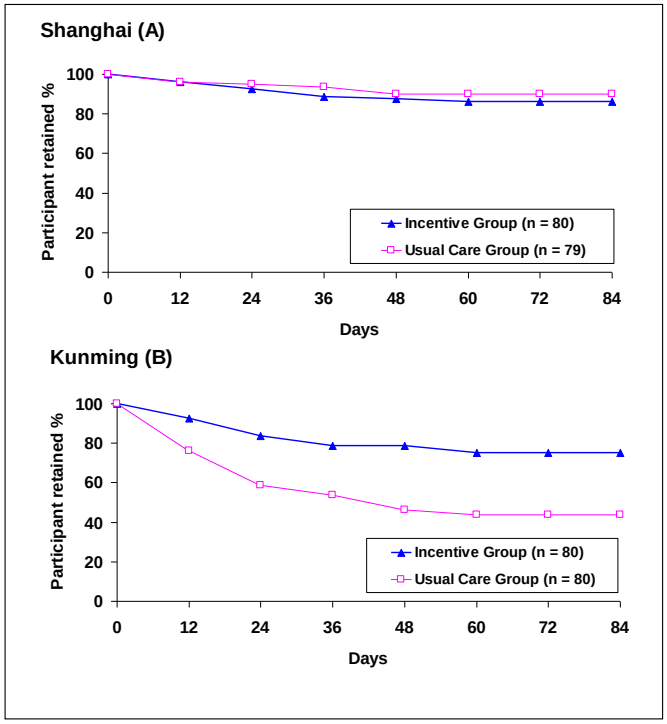


Figure 2. Treatment retention for Shanghai (A) and Kunming (B); See text for Cox modeling results

Opiate abstinence increased with MMT, & further improved by CM in Kunming

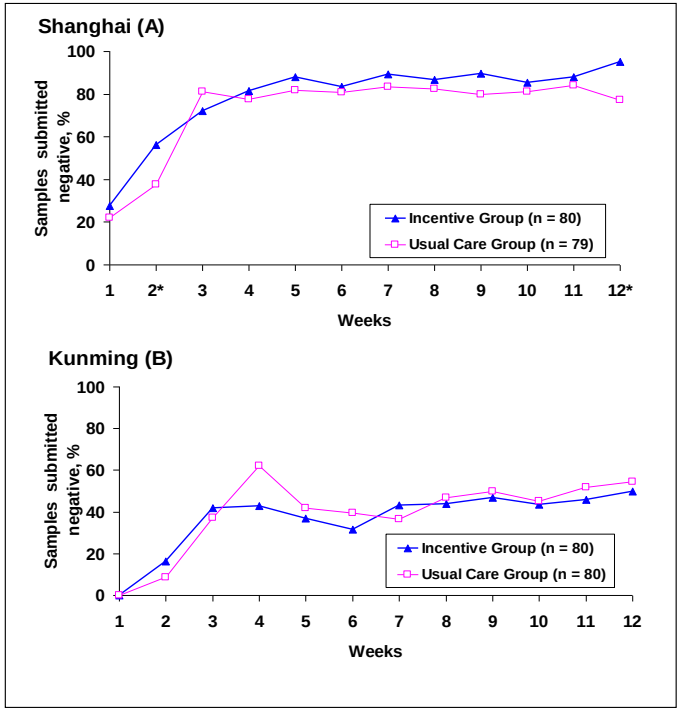


Figure 3. Percentage of negative urine among submitted samples across 12 weeks for Shanghai (A) and Kunming (B); *p< .05; See text for GEE modeling results

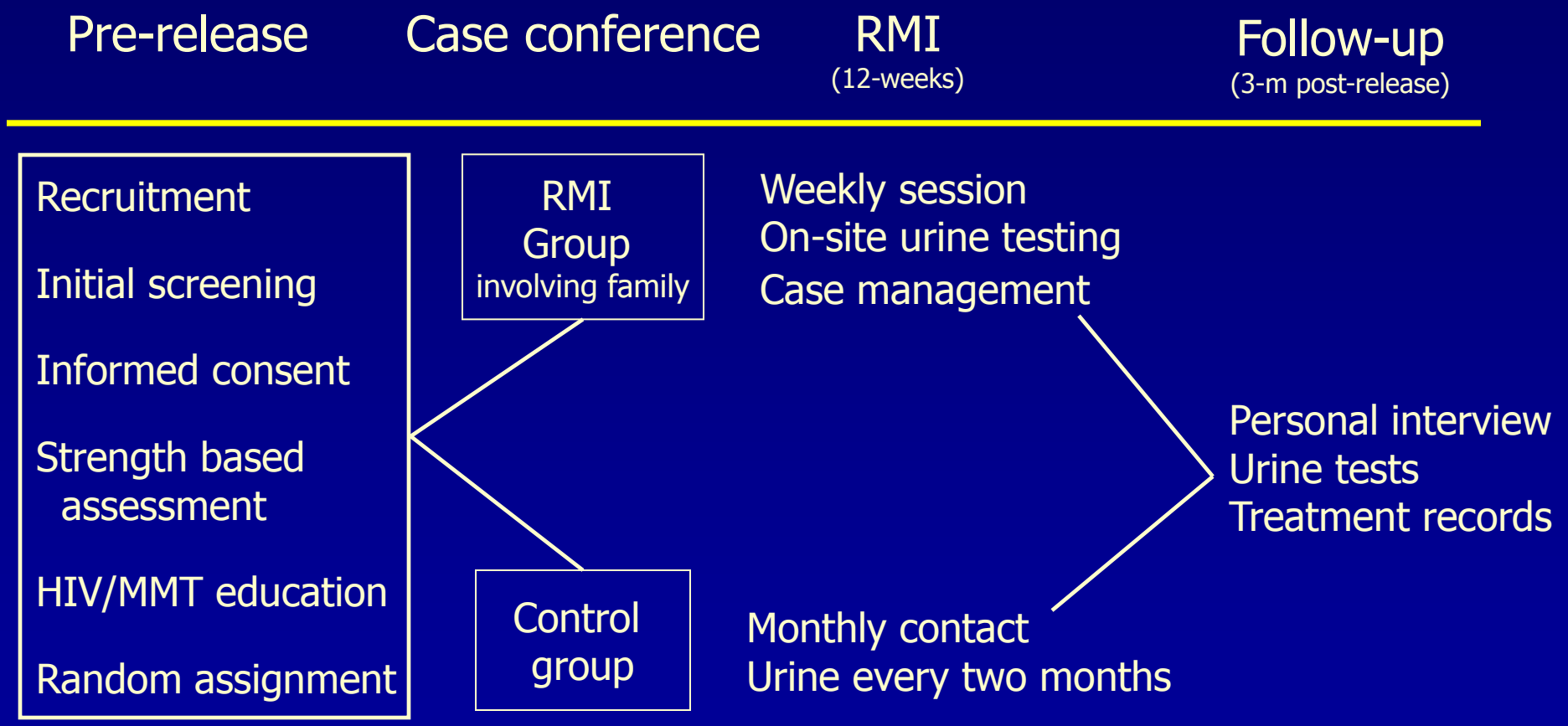
Recovery Management Intervention

- **Facilitate reintegration to community by**
  - **I. Identifying clients strengths' and local available resources**
  - **II. Promoting treatment participation if needed**
  - **III. Assisting clients in achieving desired goals and obtaining needed services**

Recovery Management Intervention Study in China

- **Shanghai Social Work Consortium**
- **Two conditions: RMI vs. Usual practice**
- **RMI includes weekly case management sessions and urine testing; Usual practice includes monthly case management sessions and urine testing**
- **N=100, 50 per condition**
- **12 weeks trial**

Recovery Management Intervention in China



Recovery Management Intervention: Preliminary findings

At the 3 month follow-up

- 6.4% reported injection drug use by the control group vs. 0% from the RMI group
- 0% were in MMT for the control group vs. 8% admitted to MMT for the RMI group
- More referral services (e.g., employment services, welfare services) were delivered to the RMI group than the control group, according to the social workers' records.

Examples of Technology-based Interventions

S-Health:
A smartphone intervention to promote self-management

Parents united with responsive parents for online support and education:
A social media intervention for parent support

TXT-CBT:
Text messaging interventions for medication adherence

Computerized behavioral intervention:
CBT/MET for depressed cannabis users in primary psychiatric care setting

SBIRT in international settings

SBIRT:
Screening, Brief Intervention, & Referral to Treatment

Other Activities

- Dissemination
  - Website www.caldar.org
  - Over 200 publications and 5 special issues in past 5 years
  - Conference organization
    - AHSR; AAPI; CALDAR Summer Institute 2006-2015; Global Health
  - Clinical training in evidence-based practices
- Mentoring, education, training
  - T32; NIDA INVEST; NIDA Summer Internship; Junior Investigator
  - Pilot studies
  - Speaker series
- Collaboration
  - Archived databases & sharing
  - Administrative data acquisition
  - Proposal development and support

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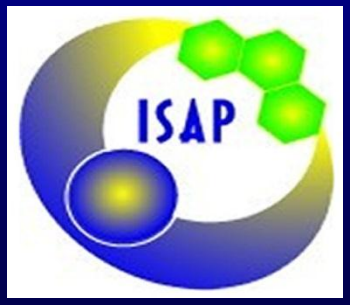

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