

**COLLEGE ON PROBLEMS  
OF DRUG DEPENDENCE**

**June 18-23, 2005  
Orlando, Florida**



*Mini-Program:*

**Focus on  
Women & Sex/Gender  
Differences**



**NIDA** NATIONAL INSTITUTE  
ON DRUG ABUSE

National Institutes of Health – U.S. Department of Health & Human Services

## PREFACE

Accumulating evidence suggests that the antecedents, consequences, and mechanisms of drug abuse and addiction are not identical in males and females and that gender is an important variable in treatment and prevention. To foster research on women and gender differences in all areas of drug abuse research (both human and animal), since 1999, the National Institute on Drug Abuse (NIDA) has encouraged the submission of College on Problems of Drug Dependence (CPDD) abstracts on this topic for the annual meeting. The response has been very gratifying as evidenced by the numerous presentations on this topic in this year's CPDD program. NIDA is pleased to provide you with this special version of the CPDD program that highlights the program schedule for presentations related to women, gender differences and drug use. Additionally, at the end of this "mini-program," we have provided the abstracts for these presentations. We hope that this mini-program will be useful for those conducting research in this area, and for those who have not become involved in gender-based research, we hope that this mini-program will suggest ways in which incorporating this perspective can advance your research program.

To support junior investigators pursuing research careers on women and gender differences, special NIDA Travel Awards have been granted annually since 1999. Each year these competitive travel awards have been given to up to 30 junior investigators (students and investigators who are less than five years past the doctoral degree or residency) conducting research on this topic whose CPDD abstract is accepted for either a poster or oral session. NIDA congratulates this year's travel awardees. A listing of the awardees along with the title of their presentation is found on the following pages.

To those of you who are junior investigators and engage in research in the area of women and gender differences, or are interested in pursuing research in this important area, NIDA will again sponsor the CPDD Women & Gender Junior Investigator Travel Awards for the 2006 CPDD meeting in Scottsdale, Arizona, June 17-22, and we encourage you to apply (see the announcement on the last page).

For additional information on NIDA's research program on women's health and gender differences, contact Dr. Cora Lee Wetherington at telephone 301-443-1263 or at [wetherington@nih.gov](mailto:wetherington@nih.gov).

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**CPDD 2005 WOMEN & GENDER  
JUNIOR INVESTIGATOR TRAVEL AWARDEES**

**Stephanie Afful**  
Washington University School of Medicine

**Alicia Allen**  
University of Minnesota

**Sudie Back, PhD**  
Medical School University of South Carolina

**Soojeong Bae**  
Seoul National University School Hospital

**Ain Chung**  
Seoul National University School Hospital

**Kelly Cosgrove, PhD**  
Yale University

**Catherine Davis**  
American University

**Frank Dillon, PhD**  
University of Miami

**Catherine Domier**  
UCLA

**Mark Ferris**  
University of South Carolina

**Andrea Gordon**  
The University of Adelaide

**William J. Kowalczyk**  
New York State Psychiatric Institute

**Kerry Grohman, PhD**  
The Research Institute on Addictions

**Steven LaRowe, PhD**  
Medical University of South Carolina

**Erin Larson**  
University of Minnesota

**Adam Leventhal**  
The University of Houston

**Sarah Meshberg-Cohen**  
Virginia Commonwealth University

**Marc Mooney**  
University of Texas

**Ashley Myracle**  
Uniformed Services University of the Health Sciences

**Noosa Niv, PhD**  
UCLA

**Joshua Ode**  
Michigan State University

**Prashni Paliwal, PhD**  
Yale University

**Gail Pereira Do Carmo, PhD**  
McLean Hospital Harvard Medical School

**Sarah Podolin**  
Bryn Mawr College

**Andrea Stone**  
Johns Hopkins University

**Jesse Suh, PhD**  
University of Pennsylvania School of Medicine

**Jean Sumner**  
Washington State University

**Dawn Thatcher, PhD**  
University of Pittsburgh

**Karen Weierstall**  
Hunter College, CUNY

**Maria Zarza, PhD**  
Behavioral Assessment Inc. & El centro de recursos  
para familias

**CPDD 2005 WOMEN & GENDER  
JUNIOR INVESTIGATOR TRAVEL AWARDEES'  
RESEARCH PRESENTATIONS**

<b>Stephanie Afful</b>	Childhood physical and sexual abuse as risk factor for substance dependence (Page 8)
<b>Alicia Allen</b>	Menstrual phase effects on psychological motives for smoking (Page 29)
<b>Sudie Back</b>	Cocaine and stress reactivity: Subjective and physiological gender differences (Page 10)
<b>Soojeong Bae</b>	Gender difference in the prevalence and the severity of white matter hyper intensities in methamphetamine users (Page 9)
<b>Ain Chung</b>	Gender difference in size and integrity of the fronto-striatal white matter tract in abstinent methamphetamine users: Diffusion tensor imaging and tractography study (Page 10)
<b>Kelly Cosgrove</b>	The influence of sex on the expression of beta2-nicotinic acetylcholine receptors using [123I]5-IA-85380 SPECT (Page 9)
<b>Catherine Davis</b>	Genetic strain, maternal environment, and biological sex interact to affect cocaine-induced taste aversions in Fischer and Lewis rats (Page 14)
<b>Frank Dillon</b>	Gender and ethnic differences across drug-abuse and sexual-risk behaviors among African American and Hispanic adolescents referred for drug abuse treatment (Page 11)
<b>Catherine Domier</b>	Gender differences in the effects of stimulants on sexual experiences (Page 9)
<b>Mark Ferris</b>	Prenatal cocaine exposure alters the monoamine system in a gender-specific manner: Dopamine D1 receptors (Page 9)
<b>Andrea Gordon</b>	Buprenorphine and methadone in pregnancy: Effects on the mother and fetus/neonate (Page 18)
<b>Kerry Grohman</b>	Developmental effects of maternal smoking during pregnancy: Gender differences in cognitive functioning at ages five to six (Page 19)
<b>William Kowalczyk</b>	Sex differences in analgesic and subjective responses to morphine in humans (Page 10)
<b>Steven LaRowe</b>	Evidence for gender differences in cue reactivity to in vivo smoking cues in nicotine-dependent smokers (Page 24)
<b>Erin Larson</b>	Effects of short- vs. long-term estrogen treatment on cocaine-induced reinstatement in OVX female rats (Page 14)

**CPDD 2005 WOMEN & GENDER  
JUNIOR INVESTIGATOR TRAVEL AWARDEES'  
RESEARCH PRESENTATIONS**

<b>Adam Leventhal</b>	Gender differences in acute tobacco withdrawal (Page 24)
<b>Sarah Meshberg-Cohen</b>	Trait anxiety and marijuana use in pregnant women (Page 15)
<b>Mark Mooney</b>	Gender and impulsivity in cocaine-dependence treatment outcomes: A multistudy analysis (Page 25)
<b>Ashley Myracle</b>	Environmental enrichment affects nicotine's activity stimulating actions in males and females differently (Page 24)
<b>Noosa Niv</b>	Gender and ethnic differences in treatment utilization, satisfaction among methamphetamine abusers (Page 21)
<b>Joshua Ode</b>	A multivariate look at drug dealing among multi-problem female youths in the US, CY2003 (Page 11)
<b>Prashni Paliwal</b>	Gender-specific effects in the effects of child maltreatment on cocaine relapse outcomes (Page 8)
<b>Gail Pereira Do Carmo</b>	Short-duration cocaine administration induces time-dependent changes during withdrawal: An investigation of gender differences (Page 25)
<b>Sarah Podolin</b>	What are the odds? A hazard analysis of drug use among opioid-dependent women (Page 18)
<b>Andrea Stone</b>	Adolescent drug opportunities, use, and use by peers: Does gender matter? (Page 11)
<b>Jesse Suh</b>	Gender differences in cocaine relapse with high-dose naltrexone (Page 25)
<b>Jean Sumner</b>	Time course of the modulatory effects of gonadal hormones on nociception, morphine antinociception, and reproductive indices in rats (Page 11)
<b>Dawn Thatcher</b>	Gender, adolescent substance-use disorders, and young-adult personality-disorder outcomes (Page 31)
<b>Karen Weierstall</b>	The role of 5-HT1A and 5-HT1B in cocaine-induced locomotor activity in male and female rats (Page 14)
<b>Maria Zarza</b>	Substance use and other risk factors related to interpersonal violence towards Latina immigrants: Recommendations to improve treatment programs for perpetrators (Page 22)

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**Sunday, June 19, 2005**

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**ORAL COMMUNICATION V**

**Ireland  
4:45 – 5:45 PM**

**COCAINE SIGNALING: “CRACKING” THE CODE**

Chairs: Wendy J. Lynch and Bertha K. Madras

5:00 *Sex differences in the molecular consequences of “binge” cocaine self-administration in rats*

W.J. Lynch and J.R. Taylor

Yale School of Medicine, New Haven, CT





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**Monday, June 20, 2005**

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**POSTER SESSION I (Breakfast)**

**Exhibition Hall  
8:00 – 10:00 AM**

**Odd-numbered posters manned first hour;  
Even-numbered, second hour**

**Set up time begins Sunday 1:00 P.M.  
Must be removed by Monday 12:00 P.M.**

**SEX DIFFERENCES AND DRUGS OF ABUSE-HUMAN STUDIES**

- 1 *Parent gender moderates relations between parent psychopathology, parenting, and child psychopathology in substance-abusing families*  
M. Burstein, C. Stanger, and J. Kamon  
University of Vermont, South Burlington, VT
- 2 *Types of child maltreatment that affect stress-coping in cocaine-dependent men and women*  
S.M. Hyman, M. Garcia and R. Sinha  
Yale University School of Medicine, New Haven, CT
- 3 *Gender-specific effects in the effects of child maltreatment on cocaine relapse outcomes*  
P. Paliwal, S.M. Hyman and R. Sinha  
Yale University School of Medicine, New Haven, CT
- 4 *Childhood physical and sexual abuse as risk factors for substance dependence*  
S.E. Afful, J.R. Kleinheider, L.B. Cottler and L.J. Bierut  
Washington University School of Medicine, St. Louis, MO
- 5 *The influence of family support on drug-use trajectories of minority female addicts*  
R.E. Brisgone  
Rutgers University School of Criminal Justice, Newark, NJ
- 6 *Female-sensitive drug treatment: Evidence of enhancements in a women-only versus a mixedgender therapeutic community*  
M.P. Huey, J.A. Johnson and P.M. Roman  
University of Georgia, Athens, GA
- 7 *Assessing sex differences on treatment effectiveness from the drug abuse treatment outcome study*  
S. Acharyya and H. Zhang  
Brown University, Providence, RI and Yale University, New Haven, CT

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## Monday, June 20, 2005

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- 8 *Offender substance abuse treatment for women: An evaluation of gender differences*  
B.R. Garner, K. Knight, D.D. Simpson and P.M. Flynn  
Texas Christian University and Institute of Behavioral Research, Forth Worth, TX
- 9 *Spiritual activities and previous spiritual experience as predictors of treatment outcome among patients in an inner city methadone maintenance program*  
A.J. Heinz, D.H. Epstein and K.L. Preston  
National Institute on Drug Abuse, Intramural Research Program, Baltimore, MD
- 10 *Improving the transition from residential to outpatient addiction treatment: Gender differences in response to supportive telephone calls*  
L.F. Haynes, S.E. Back, J. Leimberger and R. Hubbard  
Medical University of South Carolina, Charleston, SC and Duke University, Durham, NC
- 11 *Gender differences in the effects of stimulants on sexual experiences*  
C.P. Domier, A. Brown and R. Rawson  
University of California, Los Angeles, CA
- 12 *Influence of menstrual cycle phase on illicit drug use*  
B.J. Walton-Moss and M.E. McCaul  
Johns Hopkins University, Baltimore, MD
- 13 *Nicotine pretreatment increases dysphoric effects of alcohol in luteal-phase female volunteers*  
D. Penetar, E. Kouri, M. Gross, E. McCarthy, E. Peters and S.E. Lukas  
McLean Hospital, Harvard Medical School, Belmont, MA
- 14 *The influence of sex on the expression of beta2-nicotinic acetylcholine receptors using [<sup>123</sup>I]5-IA-85380 SPECT*  
K.P. Cosgrove, E.B. Frohlich, M.A. Terlecki, E. Perry, R.M. Baldwin, G.D. Tamagnan, J.P. Seibyl, S. O'Malley, C.M. Mazure and J.K. Staley  
Yale University, New Haven, VA Medical Center, West Haven, Institute for Neurodegenerative Disorders, New Haven, CT and Vanderbilt University, Nashville, TN
- 15 *Gender difference in the prevalence and the severity of white matter hyperintensities in methamphetamine users*  
S.C. Bae, I.K. Lyoo, Y.H. Sung, S.J. Bae, A. Chung, J. Hwang, M.Y. Sim, J. Kim and P.F. Renshaw  
Seoul National University College of Medicine and Hospital, Seoul, Korea and McLean Hospital Brain Imaging Center, Belmont, MA

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## Monday, June 20, 2005

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- 16 *Correlation between neuropsychological deficits and indices of vascular resistance to flow in cocaine abusers: Gender differences*  
N.M. Wilson, K. Tate, W. Better, K. Bolla, R. Herning and J.L. Cadet  
NIH/NIDA Intramural Research Program and Johns Hopkins School of Medicine, Baltimore, MD
- 17 *Gender differences in medical and non-medical use of opioids, sedatives and stimulants among heroin-dependent research volunteers*  
C.L. Steinmiller and M.K. Greenwald  
Wayne State University, Detroit, MI
- 18 *Sex differences in analgesic and subjective responses to morphine in humans*  
W.J. Kowalczyk, S.D. Comer and S.M. Evans  
New York State Psychiatric Institute, Columbia University and Queens College, New York, NY

### IMAGING – HUMAN AND ANIMAL STUDIES

- 20 *Men, women, money and beauty: Gender differences in the brain-processing of rewarding stimuli*  
B.B. Frederick, S. Dunlap, D. Ariely, D. Penetar, N. Mazar, S.E. Lukas and I. Elman  
McLean Hospital, Belmont, Harvard Medical School, Boston, and MIT, Cambridge, MA
- 39 *Gender difference in size and integrity of the fronto-striatal white matter tract in abstinent methamphetamine users: Diffusion tensor imaging and tractography study*  
Chung, I.K. Lyoo, S.J. Kim, J.S. Oh, S.C. Bae, S.J. Bae, M.Y. Sim, J. Hwang and P.F. Renshaw  
Seoul National University College of Medicine and Hospital, Seoul, Korea and McLean Hospital Brain Imaging Center, Belmont, MA

### STRESS

- 54 *Cocaine and stress reactivity: Subjective and physiological gender differences*  
S.E. Back, K.T. Brady, J.L. Jackson, S. Salstrom and H. Zinzow  
Medical University of South Carolina, Charleston, SC and University of Georgia, Athens, GA
- 58 *Gender differences in responses to stress and drug-cues in cocaine-dependent individuals*  
H.C. Fox, M. Garcia, G. Anderson, R.M. Malison, M.J. Kreek and R. Sinha

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**Monday, June 20, 2005**

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*Yale University School of Medicine, New Haven, CT and The Rockefeller University, New York, NY*

**OPIOIDS – ANIMAL STUDIES**

- 59 *Effect of handling on hormonal modulation of nociception and opioid antinociception*  
R.M. Craft and C.M. Ulibarri  
Washington State University, Pullman, WA
- 60 *Time course of the modulatory effects of gonadal hormones on nociception, morphine antinociception, and reproductive indices in rats*  
J.E. Sumner and R.M. Craft  
Washington State University, Pullman, WA
- 61 *Influence of ultra-low doses of naltrexone on the acute enhancement of morphine antinociception and attenuation of tolerance in male and female rats of four strains*  
J.M. Turner, L.M. Lomas, A.C. Barrett, S.S. Negus and M.J. Picker  
University of North Carolina at Chapel Hill, NC and McLean Hospital, Harvard Medical School, Belmont, MA
- 68 *Chronic exercise decreases sensitivity to mu opioids in female rats: Correlation with exercise output*  
M.A. Smith and M.A. Lyle  
Davidson College, Davidson, NC

**ADOLESCENTS: POLYDRUG ABUSE**

- 90 *Gender and ethnic differences across drug-abuse and sexual-risk behaviors among African American and Hispanic adolescents referred for drug abuse treatment*  
F.R. Dillon, M.S. Robbins, J. Szapocznik, C.W. Turner and H.B. Waldron  
University of Miami School of Medicine, Miami, FL and Oregon Research Institute, Eugene, OR
- 91 *Adolescent drug opportunities, use, and use by peers: Does gender matter?*  
A.L. Stone, H.D. Chilcoat and N. Ialongo  
Johns Hopkins University Bloomberg School of Public Health, Baltimore, MD
- 92 *A multivariate look at drug dealing among multi-problem female youths in the US, CY2003*  
J. Ode, C.F. Rios-Bedoya and J.C. Anthony  
Michigan State University, East Lansing, MI and Johns Hopkins University, Baltimore, MD

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**Monday, June 20, 2005**

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- 96 *Maternal maltreatment, substance abuse, and child's dysregulation*  
A.C. Mezzich, M. Swaney and B.S. Day  
University of Pittsburgh, Pittsburgh, PA

**CLUB DRUGS AND HALLUCINOGENS – HUMAN STUDIES**

- 111 *Incident cases of ecstasy use in the United States, 2003*  
G. Mazzotti and J.C. Anthony  
UPCH, Lima, Peru, Johns Hopkins University, Baltimore, MD and  
Michigan State University, East Lansing, MI
- 112 *Economic predictors of ecstasy consumption and related problems in a  
general community sample*  
Ben Abdallah, L.M. Scheier, J.A. Inciardi, J. Copeland and L.B. Cottler  
Washington University, St. Louis, MO, LARS Research Institute, Las  
Vegas, NV, University of Delaware, Coral Gables, FL and National Drug  
and Alcohol Research Center, Sydney, Australia
- 115 *Three-site study of prescription drug abuse among ecstasy users*  
S.P. Kurtz, H.L. Surratt, J.A. Inciardi, L. Cottler and J. Copeland  
University of Delaware, Coral Gables, FL, Washington University, St.  
Louis, MO and University of New South Wales, Sydney, Australia

**PSYCHIATRIC COMORBIDITY I**

- 122 *Disturbed sleep, mental health problems, and substance abuse among women  
with victimization experiences*  
R. Walker, L. Shannon and T.K. Logan  
University of Kentucky, Lexington, KY
- 125 *Medication adherence in co-occurring disorders*  
M.V. Pantalon, R.S. Schottenfeld, J.A. Cramer, K.M. Carroll and B.J.  
Rounsaville  
Yale University School of Medicine, New Haven, CT

**THEORETICAL/COMMENTARY**

- 142 *Neuropsychological impairment of drug abusers: Commentary*  
A.M. Horton, Jr.  
Psych Associates, Towson, MD, NDRI-CIRP, New York, NY
- 152 *Early findings - Colorado Women's Prison Project: Comparing substance abuse  
(SA) behaviors, behavioral histories, service needs/utilization of 2 age cohorts  
with SA problems*

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**Monday, June 20, 2005**

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M.L. Schoeneberger and J.Y. Sacks  
NDRI-CIRP, New York, NY

**Oral Communication IX**

**Crown Hall  
11:00 AM – 1:00 PM**

**EFFECTS OF ALCOHOL AND NOVEL TREATMENTS**

Chairs: Elise M. Weerts and Keith L. Williams

12:30 *Alcohol use to intoxication predicts poorer treatment outcomes in methadone-stabilized pregnant women*

M. Tuten and H.E. Jones

Johns Hopkins University School of Medicine, Baltimore, MD

**Oral Communication X**

**Crown Hall  
2:30 – 4:30 PM**

**DRUG AND THE HPA AXIS: STRESS TESTS**

Chairs: John R. Mantsch and Lisa M. Schrott

2:30 *Gender differences of the stress responsive hormones: Prolactin, ACTH, and cortisol in normal and former cocaine-dependent volunteers*

H.L. Hofflich, Y. Gurevich, G. Bart, A. Ho and M.J. Kreek

The Rockefeller University, New York, NY

2:45 *The effects of cigarette smoking on mood states and the HPA axis during menstrual cycle phase*

J.H. Mendelson, M.B. Sholar, N.V. Goletiani, A.J. Siegel and N.K. Mello

McLean Hospital, Belmont, and Harvard Medical School, Boston, MA

3:00 *Reduced salivary cortisol after overnight tobacco deprivation*

N.C. Eid, M. al'Absi, E.T. Moolchan, S. Boyd and W.B. Pickworth

NIH/NIDA Intramural Research Program, Baltimore, MD and University of Minnesota, Duluth, MN

4:15 *The hypothalamic-pituitary-adrenal axis is activated during postnatal withdrawal from prenatal opiate exposure*

L.M. Schrott and L.M. Franklin

Louisiana State University Health Sciences Center, Shreveport, LA

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**Tuesday, June 21, 2005**

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**POSTER SESSION II (Breakfast)**

**Exhibition Hall  
8:00 – 10:00 AM**

**Odd-numbered posters manned first hour;  
Even-numbered, second hour**

**Set up time begins Monday 1:00 P.M.  
Must be removed by Tuesday 12:30 P.M.**

**SEX DIFFERENCES AND DRUGS OF ABUSE – ANIMAL STUDIES**

- 9      *Sex differences in behavioral sensitization to cocaine*  
Nazarian, L.M. Kemen, H.B.K. Wu, T. Niyomchai and V. Quinones-  
Jenab  
Hunter College/City University of New York, New York, NY
- 10     *Genetic strain, maternal environment, and biological sex interact to affect  
cocaine-induced taste aversions in Fischer and Lewis rats*  
C.M. Davis, P.G. Roma, M.A. Keeler and A.L. Riley  
American University, Washington, DC
- 11     *Chronic estradiol administration mediates the inflammatory response to  
formalin in OVX female rats*  
T. Kuba, L.M. Kemen and V. Quinones-Jenab  
Hunter College and City University of New York, New York, NY
- 13     *Effects of short- vs. long-term estrogen treatment on cocaine-induced  
reinstatement in OVX female rats*  
E.B. Larson, M.E. Roth, J.J. Anker and M.E. Carroll  
University of Minnesota, Minneapolis, MN
- 14     *Effects of progesterone and estrogen antagonists on cocaine-induced  
behavioral psychomotor responses*  
H.B.K. Wu, T. Niyomchai, K. Weierstall, A.C.E. Minerly, D. Hunter, J.  
Weiner, W. Sun, L. Zhou, S. Jenab and V. Quinones-Jenab  
Hunter College and City University of New York, New York, NY
- 15     *The role of 5-HT1A and 5-HT1B in cocaine-induced locomotor activity in  
male and female rats*  
K.M. Weierstall, T. Niyomchai, H.B.K. Wu, A. Akhavan, J. Weiner, W.  
Sun, A. Nazarian, S. Jenab and V. Quinones  
Hunter College and City University of New York, New York, NY
- 16     *Acute effects of testosterone and progesterone on cocaine self-administration  
by female rhesus monkeys*  
N.K. Mello, J.H. Mendelson, I.M. Knudson and M. Kelly

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**Tuesday, June 21, 2005**

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McLean Hospital, Belmont, and Harvard Medical School, Boston, MA

- 17 *Ovarian hormones modulate levels of dopamine and turnover rates after acute cocaine administration*  
T. Niyomchai, S.J. Russo, E.D. Festa and V. Quinones-Jenan  
City University of New York and Hunter College, New York, NY
- 18 *Prenatal cocaine exposure alters the monoamine system in a gender-specific manner: Adrenergic receptors and norepinephrine transporter*  
J.M. Silvers, M. Ferris, U. Hasselrot, B.J. Strupp, C.F. Mactutus and R.M. Booze  
University of South Carolina, Columbia, SC and Cornell University, Ithaca, NY
- 19 *Prenatal cocaine exposure alters the monoamine system in a gender-specific manner: Dopamine D1 receptors*  
M.J. Ferris, J.M. Silvers, B.J. Strupp, C.F. Mactutus and R.M. Booze  
University of South Carolina, Columbia, SC and Cornell University, Ithaca, NY
- 20 *Acute and repeated intravenous cocaine-induced locomotor activity is altered as a function of sex and gonadectomy*  
S.B. Harrod, C.F. Mactutus, M. Welch, C.E. Browning and R.M. Booze  
University of South Carolina, Columbia, SC

#### **DRUG ABUSE IN ADOLESCENTS - ANIMAL STUDIES**

- 24 *Sex and age effects on cocaine-stimulated motor behavior and voluntary, oral cocaine consumption*  
Q.D. Walker, S.L. Parylak, J.M. Caster and C.M. Kuhn  
Duke University Medical Center, Durham, NC

#### **MARIJUANA-HUMAN STUDIES**

- 48 *Trait anxiety and marijuana use in pregnant women*  
S. Meshberg-Cohen, D. Langhorst, T. Vance, K. Reid-Quiñones and D. Svikis  
Virginia Commonwealth University, Richmond, VA

#### **COCAINE BEHAVIOR AND TREATMENT – HUMAN STUDIES**

- 61 *Effectiveness of motivational incentives for drug abuse recovery in multiple treatment history and treatment-naïve outpatients*  
T.K. Killeen, M.L. Copersino and M.L. Stitzer  
Medical University of South Carolina, Charleston, SC, NIH/NIDA Intramural Research Program, and Johns Hopkins University, Baltimore,



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**Tuesday, June 21, 2005**

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MD

**COCAINE EPIDEMIOLOGY**

- 72 *Characteristics of female cocaine users with access to firearms*  
L.B. Cottler, C. Callahan Meeks and A. Ben Abdallah  
Washington University School of Medicine, St. Louis, MO
- 73 *Characteristics of cocaine users who buy and sell sex*  
C.L.W. Striley and L.B. Cottler  
Washington University School of Medicine, St. Louis, MO
- 74 *Risky business: Sexual behaviors in cocaine-dependent individuals*  
J.R. Kleinheider, S.E. Afful, L.B. Cottler and L.J. Bierut  
Washington University School of Medicine, St. Louis, MO
- 75 *Change in high-risk sexual behaviors between community and court-recruited female cocaine users in St. Louis*  
C. Callahan Meeks, S. Bradford, A. Ben Abdallah and L.B. Cottler  
Washington University School of Medicine, St. Louis, MO

**COMORBIDITY II: PTSD, ADHD, AND ASPD**

- 78 *Pathways between childhood victimization and adult sex trading among substance-using women*  
V.A.S. Krishna, C. Meeks, A. Ben Abdallah and L. Cottler  
Washington University School of Medicine in St. Louis, St. Louis, MO
- 86 *Complicated grief treatment for persons with substance use disorders: A pilot study*  
Zuckoff, E. Frank, D. Daley, J. Cornelius, K. Seligman, R. Silowash and K. Shear  
University of Pittsburgh School of Medicine, Pittsburgh, PA
- 92 *Antisocial personality and stress-induced brain activation in cocaine-dependent individuals – potential sex differences*  
C.R. Li, T.R. Kosten and R. Sinha  
Yale University, New Haven, CT
- 93 *Borderline personality and substance use in women*  
U. Feske, R.E. Tarter, L. Kirisci and P.A. Pilkonis  
University of Pittsburgh and Medical Center, Pittsburgh, PA

**PERINATAL DRUG EXPOSURE – HUMAN STUDIES**

- 95 *Neonates of drug-dependent mothers in a university hospital in Mexico*

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Gutierrez Padilla, R. Vargas-Lopez, M. de la Torre, L. Avalos and O. Campollo  
UCINEX Antiguo Hospital Civil de Guadalajara, CUCS, Universidad de Guadalajara and Centro de Estudios de Alcoholismo y Adicciones, Guadalajara, Mexico

- 96 *A computer-based brief motivational intervention for perinatal drug use: Preliminary results from a phase II clinical trial*  
S.J. Ondersma, D.S. Svikis, J.R. Beatty, L.A. Strathdee and C.R. Schuster  
Wayne State University, Detroit, MI and Virginia Commonwealth University, Richmond, VA
- 97 *Assessment of recent maternal cocaine use in a longitudinal study of prenatal cocaine exposure*  
E.S. Bandstra, V.H. Accornero, L. Xue, C.E. Morrow, V. Moodley and J.C. Anthony  
University of Miami School of Medicine, Miami, FL and Michigan State University, East Lansing, MI
- 98 *Effect of prenatal cocaine exposure on examiner-rated behavior at age 7: Pathways involving caregiver behavioral health*  
V.H. Accornero, J.C. Anthony, C.E. Morrow, L. Xue and E.S. Bandstra  
University of Miami School of Medicine, Miami, FL and Michigan State University, East Lansing, MI
- 99 *Assessment of substance abuse risk factors in 9-year-old prenatally drug-exposed children using the ALEXSA*  
S. Minnes, T.A. Ridenour, L.T. Singer, A. Miller and S. Satayathum  
Case Western Reserve University, Cleveland, OH and The Pennsylvania State University, State College, PA
- 100 *Comparing pregnancy outcomes and cost efficacies of an aggressive outreach and referral programs for substance-abusing women*  
U.O. Bailey, R.J. Harrison, A.L. English, R. Cox, D. Farr and B. Vayhinger  
Howard University, Washington, DC, Prince George's Hospital Center, Healthy Babies and Center for Addiction and Pregnancy, Cheverly, MD
- 101 *In vitro and in vivo effects of cocaine on the fetal-placental endocrine axis in humans*  
A.D. Williams, B. Ahluwalia, L. Kaul and W. Pei  
Howard University College of Medicine, Washington, DC
- 102 *Methadone metabolism by pre-term human placentas*  
T.L. Hieronymus, T.N. Nanovskaya, S.V. Deshmukh, G.D.V. Hankins and M.S. Ahmed  
University of Texas Medical Branch, Galveston, TX

- 103 *The effects of methadone, buprenorphine and levo-alpha-acetylmethadol on human placental aromatase*  
O.L. Zharikova, S.V. Deshmukh, T.N. Nanovskaya, I.A. Nekhayeva,  
G.D.V. Hankins and M.S. Ahmed  
University of Texas Medical Branch, Galveston, TX
- 104 *Role of P glycoprotein in Transplacental Transfer of Methadone*  
T.N. Nanovskaya, I.A. Nekhayeva, N. Karunaratne, K. Audus, G.D.V.  
Hankins and M.S. Ahmed  
University of Texas Medical Branch, Galveston, TX and University of  
Kansas, Lawrence, KS
- 105 *Effect of nicotine-specific antibodies, Nic311 and Nic-IgG, on the transfer of nicotine across human placenta*  
Nekhayeva, T. Nanovskaya, P. Pentel, G.D.V. Hankins and M. S. Ahmed  
University of Texas Medical Branch, Galveston, TX and University of  
Minnesota, Minneapolis, MN
- 106 *Retrospective examination of the relationship between maternal methadone dose and neonatal abstinence syndrome*  
B. Shapiro, A. Martinez, M. Pletcher, N. Haug and S. Sniderman  
University of California and San Francisco General Hospital, San  
Francisco, CA
- 107 *Buprenorphine and methadone in pregnancy: Effects on the mother, fetus and neonate*  
A.L. Gordon, H. Stacey, V. Pearson, R.R. Haslam, O.V. Lopatko and J.M.  
White  
University of Adelaide, Women's and Children's Hospital, and Drug and  
Alcohol Services Council, Adelaide, Australia
- 108 *What are the odds? A hazard analysis of drug use among opioid-dependent women*  
S.R. Podolin and K. Kaltenbach  
Thomas Jefferson University, Philadelphia, PA
- 109 *History of physical abuse and problem drinking and drug use in pregnant women*  
A.H. Alvanzo, L. Keyser-Marcus and D.S. Svikis  
Virginia Commonwealth University, Richmond, VA
- 110 *Reasons for drinking in pregnant smokers and non-smokers*  
Sepulveda, L. Keyser-Marcus, D. Langhorst, J. Draper, S. Kornstein and  
D. Svikis  
Virginia Commonwealth University, Richmond, VA

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- 111 *Where there's smoke...there's fire? Applications for prenatal tobacco and other drug use*  
D.S. Svikis, D. Langhorst, L. Keyser-Marcus, A. Alvanzo and K. Reid-Quinones  
Virginia Commonwealth University, Richmond, VA
- 112 *Biochemical verification of smoking status in pregnant and recently postpartum women*  
S.T. Higgins, S.H. Heil, G.J. Badger, J.A. Mongeon, L.J. Solomon, L. McHale and I.M. Bernstein  
University of Vermont, Burlington, VT
- 113 *Less is more. Encouraging reductions in tobacco use with newly postpartum women*  
L.A. Keyser-Marcus, G.C. Britt, L.D. Meloy, P. Kum-Nji, K. Reid-Quinones and D.S. Svikis  
Virginia Commonwealth University, Richmond, VA
- 114 *Voucher-based incentives for abstinence from cigarette smoking in pregnant and postpartum women*  
S.H. Heil, S.T. Higgins, L. Solomon, I.M. Bernstein, M.E. Lynch, L. McHale, N. Jacuzzi and A. Dumeer  
University of Vermont, Burlington, VT
- 115 *Developmental effects of maternal smoking during pregnancy: Gender differences in cognitive functioning at ages five to six*  
K. Grohman, E. Edwards, R. Eiden and K. Leonard  
The State University of New York at Buffalo, Buffalo, NY

#### **SEDATIVE-HYPNOTICS, INHALANTS**

- 118 *Critical periods for the effects of toluene exposure on developmental delays in rats*  
J.C. Batis, J.H. Hannigan and S.E. Bowen  
Wayne State University, Detroit, MI

#### **PRESCRIPTION DRUG ABUSE**

- 138 *Gender differences in sources of prescription drugs for illicit use*  
S.E. McCabe and C.J. Boyd  
University of Michigan, Ann Arbor, MI
- 142 *Changes in OxyContin® use among treatment seekers: Data from the DENS study*  
D. Carise, A. Camilleri, A.T. McLellan and G. Woody

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Treatment Research Institute and University of Pennsylvania,  
Philadelphia, PA

**PREVENTION AND POLICY**

- 151 *Drug abuse prevention in Latin immigrant population in the autonomous region of Valencia (Spain)*  
S. Tortajada, M.J. Perez, M. Castellano, L. Alapont, A. Vidal, R. Aleixandre, J.C. Valderrama and J.C. Perez de los Cobos  
Instituto de Historia de la Ciencia y Documentación Lopez Piñero (UV-CSIC), Generalitat Valenciana, AEPa, FEPAD, Valencia, and Hospital Sant Pau i la Santa Creu, Barcelona, Spain
- 152 *Maternal substance abuse, childhood and current victimization among battered women in New York City*  
T. Jospitre, R.E. Sage, S. Griffing, M. Chu, L. Madry and B.J. Primm  
Urban Resource Institute, New York, NY

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**Wednesday, June 22, 2005**

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**POSTER SESSION III (Breakfast)**

**Exhibition Hall  
8:00 – 10:00 AM**

**Odd-numbered posters manned first hour;  
Even-numbered, second hour**

**Set up time begins Tuesday 1:00 P.M.  
Must be removed by Wednesday 12:30 P.M.**

**METHAMPHETAMINE, AMPHETAMINE – HUMAN STUDIES**

- 13 *Differences in women methamphetamine and cocaine users seeking residential treatment: Characteristics and predictors of premature discharge*  
L. White, A.J. Rush, V. Nguyen, H. Voet, T. Carmody and B. Crowell  
University of TexasSouthwestern Medical Center, Dallas, TX and NEXUS  
Recovery Center, Inc., Dallas TX
- 14 *Gender and ethnic differences in treatment utilization, satisfaction and outcomes among methamphetamine abusers*  
N. Niv and Y. Hser  
University of California, Los Angeles, CA

**ADOLESCENTS: ABUSE OF STIMULANTS, OPIOIDS, AND ALCOHOL**

- 19 *A comparison of buprenorphine/naloxone adolescent opiate subjects and the Drug Evaluation Network Study*  
G.E. Woody  
University of Pennsylvania, Philadelphia, PA and Treatment Research  
Institute, Philadelphia, PA
- 22 *Childhood and adolescent antecedents of drug use in adulthood*  
M.E. Ensminger, H.S. Juon and K.E. Fothergill  
Johns Hopkins University Bloomberg School of Public Health, Baltimore,  
MD
- 28 *Drug problems and the co-occurrence of behavioral disturbances in American youth*  
C.L. Storr and V.H. Accornero  
Johns Hopkins University Bloomberg School of Public Health, Baltimore,  
MD and University of Miami School of Medicine, Miami, FL

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## Wednesday, June 22, 2005

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- 29 *A multivariate look at drug-dealing among multi-problem male youths in the US, CY2003*  
Bustamante, C.F. Ríos-Bedoya and J.C. Anthony  
University Cayetano Heredia Peruana, Lima, Peru, Johns Hopkins University, Baltimore, MD and Michigan State University, East Lansing, MI
- 30 *Co-occurring conditions in adolescents with opioid use disorders versus marijuana/alcohol use disorders*  
G. Subramaniam, M. Stitzer, P. Harrell and M.J. Fishman  
Johns Hopkins University School of Medicine, Baltimore, MD and Mountain Manor Treatment Center, Baltimore, MD
- 33 *Adolescent reports of childhood trauma and current implications of sexual behaviors and illicit drug use*  
H.T. Vo, W.M. Aklin, M.A. Bornoalova, M.A. Gwadz and C.W. Lejuez  
University of Maryland College Park, College Park, MD and NDRI, New York, NY
- 35 *Young people and alcohol: Taste perception, attitudes and experiences*  
J. Copeland, R. Stevenson, P. Gates and P. Dillon  
University of New South Wales and Macquarie University, Sydney, Australia

### ALCOHOL

- 40 *Substance use and other risk factors related to interpersonal violence towards Latina immigrants: Recommendations to improve treatment programs for perpetrators*  
M.J. Zarza  
Behavioral Assessment Inc. Santa Monica, CA, and El Centro-Catholic Charities, Trenton, NJ
- 42 *Coping with stressful events: Influence of parental alcoholism and race in a community sample of women*  
M. Amodeo, M.L. Griffin, I. Fassler, C. Clay and M.A. Ellis  
Boston University School of Social Work, Boston, MA
- 43 *College students' perceptions of alcohol, marijuana and sexual activity: Formative research using focus groups*  
S.D. Ceperich, K.S. Ingersoll and T. Olds  
Virginia Commonwealth University, Richmond, VA

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**Wednesday, June 22, 2005**

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**METHYLPHENIDATE**

- 92 *Sex differences between young female and male Sprague-Dawley rats in response to methylphenidate*  
N. Dafny, P.B. Yang and A.C. Swann  
University of Texas Medical School at Houston, Houston, TX

**OPIOID TREATMENT: BUPRENORPHINE AND NALTREXONE**

- 127 *Predictors of outcome in the NIDA Clinical Trials Network randomized, multicenter trial of buprenorphine-naloxone versus clonidine for short-term medically supervised withdrawal*  
D. Ziedonis, L. Amass, M. Steinberg, G. Woody, J. Krejci and W. Ling  
Robert Wood Johnson Medical School, Piscataway, NJ, University of Pennsylvania, Philadelphia, PA, Friends Research Institute, and University of California, Los Angeles, CA

**TREATMENT FOR POLYDRUG ABUSE**

- 156 *Child welfare costs at four-year followup for mothers attending women-only versus mixedgender long-term residential treatment*  
W.B. Kissin, R.G. Orwin, R. Claus, K. Campbell, C.E. Grella, T.J. Williams, A. Krupski and S. Green Westat  
Rockville, MD, University of Missouri, St. Louis, MO, Washington Div. of Alcohol and Substance Abuse, Olympia, WA and University of California, Los Angeles, CA

**Symposium X**

(No abstracts are available for these presentations)

**Crown Hall**

**10:00 AM – 12:30 PM**

**CANNABINOIDS DURING DEVELOPMENT: FROM THE LAB TO THE CLINIC**

Chairs: Sari Izenwasser and Diana Dow-Edwards

- 10:00 *Prenatal exposure to marijuana and cigarettes: Long-term effects of prenatal marijuana exposure on cognitive functioning*  
Peter Fried  
Carleton University, Ottawa, Canada
- 10:25 *Effects of prenatal cannabinoids on several key genes for neurotransmitter function*  
Julian Romero and Javier Fernandez-Ruiz  
Fundacion Hospital Alcorcon and Universidad Complutense de Madrid,



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**Wednesday, June 22, 2005**

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Spain

**Oral Communications XV**

**Scotland**

**10:00 AM – 12:00 PM**

**COGNITION: IT'S THE THOUGHT THAT COUNTS**

Chairs: Paulo J. Cunha and Sara L. Simon

10:15 *Cognitive failure in cannabis and club drug users in comparison to non-users in a populationbased sample*

U. Kandler, M. Piechatzek, F. Indlekofer, R. Lieb, H.U. Wittchen and C.G. Schuetz

Max Planck Institute, Ludwig-Maximilians Universitat, Munich, Technische Universitat, Dresden, and Friedrich-Wilhelms-University, Bonn, Germany

**Oral Communications XVI**

**Ireland**

**10:00 AM – 12:00 PM**

**MICKEY VS MINNIE: SEX DIFFERENCES AND DRUGS OF ABUSE**

Chairs: Rajeev Ramchand and Marc E. Mooney

10:00 *Gender differences in acute tobacco withdrawal*

A.M. Leventhal, A.J. Waters, W. Pickworth, N. Eid, S. Boyd, E.T. Moolchan and C. Lerman

University of Texas M.D. Anderson Cancer Center, Houston, TX, NIH/NIDA Intramural Research Program, Baltimore, MD and University of Pennsylvania, Philadelphia, PA

10:15 *Evidence for gender differences in cue reactivity to in vivo smoking cues in nicotine-dependent smokers*

S.D. LaRowe, H.P. Upadhyaya, M.E. Saladin, M.J. Carpenter and K.T. Brady

Medical University of South Carolina, Charleston, SC

10:30 *Environmental enrichment affects nicotine's activity stimulating actions in males and females differently*

A.B. Myracle, S.S. Shafer, B.M. Elliott and N.E. Grunberg

Uniformed Services University of the Health Sciences, Bethesda, MD

10:45 *Relationship between quit length, cue-responsiveness and craving in former smokers: A gender analysis*

M. Mahabir, L. Zawertailo, M. Zack, P. Selby and U. Busto

University of Toronto, Toronto, Canada

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## Wednesday, June 22, 2005

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- 11:00 *Sex differences in the linkage between adolescent work experience and alcohol, tobacco, and marijuana use in an urban environment*  
R. Ramchand, N.S. Ialongo and H.D. Chilcoat  
Johns Hopkins University Bloomberg School of Public Health,  
Baltimore, MD
- 11:15 *Gender and impulsivity in cocaine-dependence treatment outcomes: A multistudy analysis*  
M. Mooney, C. Green, F.G. Moeller, H. Rhoades, J. Grabowski and J. Schmitz  
University of Texas-Houston, Houston, TX
- 11:30 *Gender differences in cocaine relapse with high-dose naltrexone*  
J.J. Suh, H.M. Pettinati and K.M. Kampman  
University of Pennsylvania, Philadelphia, PA
- 11:45 *Short-duration cocaine administration induces time-dependent changes during withdrawal: An investigation of gender differences*  
G. Pereira Do Carmo, N.L. Sparkman, R. Kohman, G.R. King and G.W. Boehm  
McLean Hospital, Harvard Medical School, Belmont, MA, University of Illinois at UrbanaChampaign, IL and Texas Christian University, Fort Worth, TX

### **Symposium XII**

(No abstracts are available for these presentations)

**England**

**11:30 AM – 12:30 PM**

### **COMBINATIONS OF MEDICATION FOR THE TREATMENT OF DRUG ADDICTION**

Chairs: Kyle Kampman and Helen Pettinati

- 11:30 *The efficacy of sertraline augmented with bupropion in cocaine-dependent patients with depressive symptoms*  
Alison Oliveto  
University of Arkansas for Medical Sciences, Little Rock, AR
- 11:50 *The combination of naltrexone and disulfiram for the treatment of cocaine and alcohol dependence*  
Helen Pettinati  
University of Pennsylvania School of Medicine, Philadelphia, PA
- 12:10 *The combination of amantadine and propranolol for the treatment of cocaine-dependent patients with severe cocaine withdrawal symptoms*  
Kyle M. Kampman  
University of Pennsylvania School of Medicine and The Philadelphia VA

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**Wednesday, June 22, 2005**

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Medical Center, University of Pennsylvania Treatment Research Center,  
Philadelphia, PA

**Symposium XIII**

(No abstracts are available for these presentations)

**England**

**2:00 – 4:00 PM**

**TO TREAT OR NOT TO TREAT, IS THAT THE QUESTION?  
INTERNATIONAL PERSPECTIVES ON NEONATAL ABSTINENCE  
SYNDROME ASSESSMENT AND TREATMENT**

Chairs: Loretta P. Finnegan and Hendree Jones

- 2:00 *Perspectives in the treatment of neonatal abstinence in Vienna, Austria*  
Gabriele Fischer  
Medical University of Vienna, Vienna, Austria
- 2:25 *Various solutions for the treatment of NAS in the United States*  
Karol Kaltenbach  
Thomas Jefferson University, Philadelphia, PA
- 2:50 *Neonatal withdrawal in the Antipodes: Management of NAS in Australia*  
Adrian Dunlop  
Turning Point Alcohol and Drug Centre, Fitzroy, Australia
- 3:15 *Maternal methadone dose and length of stay for NAS in a Canadian hospital*  
Peter Selby  
University of Toronto, Canada
- 3:40 *Comparison of methods utilized around the world for the assessment and  
treatment of neonatal abstinence syndrome*  
Discussant: Loretta P. Finnegan  
Office of Research on Women's Health, NIH, Bethesda, MD

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**Thursday, June 23, 2005**

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**POSTER SESSION IV (Breakfast)**

**Exhibition Hall  
7:30 – 9:30 AM**

**Odd-numbered posters manned first hour;  
Even-numbered, second hour**

**Set up time begins Wednesday 1:00 P.M.  
Must be removed by Thursday 12:30 P.M.**

**HIV/AIDS, HEPATITIS C**

- 11 *Alcohol use among HIV-positive individuals: The impact of gender, personality, and drug dependence*  
C.J. Heckman, K.S. Ingersoll, J. Cohen and A. Walker  
Virginia Commonwealth University, Richmond, VA
- 15 *HIV risk and treatment entry among drug users in Rio de Janeiro, Brazil: Geo-behavioral analyses*  
A.A. Simoes, F.I. Bastos, R.I. Moreira, C. Barbosa, W.B. Azevedo, M. Magalhaes, A. Hillier and D.S. Metzger  
Health Department of Rio de Janeiro State, and Oswaldo Cruz Foundation, Rio de Janeiro, Brazil and University of Pennsylvania, Philadelphia, PA
- 18 *A comparison of drug-use patterns and HIV/STD prevalence among female sex workers in two Mexican-U.S. border cities*  
T.L. Patterson, S.J. Semple, J. Bucardo, A. DeLaTorre, M. Fraga, H. Staines Orozco, J. Salazar Reyna, H. Amaro, C. Magis, S.A. Strathdee  
UCSD, La Jolla, UCLA, Los Angeles, CA, Universidad Autonoma de Baja-CA, U. Autonoma de Ciudad Juarez, and CENSIDA, Mexico, U. Autonoma de Tamaulipas, Northeastern University of Boston, MA
- 19 *Sexually transmitted diseases in poor female crack users of Porto Alegre, Brazil*  
F.H. Kessler, F. Pechansky, L. Von Diemen, J. Inciardi, and H. Surratt  
Federal University of Rio Grande, Porto Alegre, Brazil

**LITERATURE REVIEW**

- 23 *Gender and the substance abuse treatment workforce: Implications for the field*  
N.A. Roget, S.A. Storti, E.C. Albers, P.K. Horvatich and A.H. Skinstad  
University of Nevada, Reno, NV, Brown University, Providence, RI, Virginia Commonwealth University, Richmond, VA and University of Iowa, Iowa City, IA

**PROGRAM DESCRIPTION**

- 30 *Men (and women) at work: Success stories of the Job Seekers' Workshop*  
T. Rieckmann, L. Keyser-Marcus, S. Back, C. Wong, P. Loeb, T. Allen  
and D. Svikis  
Oregon Health Sciences University, Portland, OR, Virginia  
Commonwealth University, Richmond, VA, Medical University of South  
Carolina, Charleston, SC, Johns Hopkins University, Baltimore, MD and  
Allen & Loeb Assoc., San Francisco, CA
- 31 *Creating a spiritual community that reinforces drug abstinence: Preliminary  
report*  
M.L. Kerwin, K. Walker-Smith, R.A. Corbin, T.M. Faranda-Diedrich, J.  
Menarde and K.C. Kirby  
Rowan University, Glassboro, NJ, Treatment Research Institute and  
University of Pennsylvania School of Medicine, Philadelphia, PA
- 38 *Effectiveness of an engagement and embeddedness model to reduce HIV risk  
behaviors among Hispanic drug-using women*  
R.R. Robles, T.D. Matos, E.I. Quiñones, I. Carrión and C.R. Rodríguez  
Universidad Central del Caribe, School of Medicine, Bayamon, PR
- 43 *Establishing a statewide research coalition to address the causes and  
prevention of youth tobacco use*  
J.R. Koch, R.L. Balster, E.E. Dowdy, S.L. Hart and R.W. Pickens  
Virginia Commonwealth University, Richmond, VA

**CRIMINAL JUSTICE**

- 47 *A history of juvenile justice involvement is associated with higher lifetime  
substance abuse among female adult inmates*  
G.C. Villalobos, K.L. Cropsey, M.F. Weaver and M.L. Stitzer  
Virginia Commonwealth University, Richmond, VA and Johns Hopkins  
University, Baltimore, MD
- 48 *Drug use differences by race in women prisoners*  
M.F. Weaver, G.C. Villalobos, and K.L. Cropsey  
Virginia Commonwealth University, Richmond, VA
- 49 *Trauma histories among California women inmates*  
N.P. Messina, M.L. Prendergast and W. Burdon  
University of California, Los Angeles, CA

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**Thursday, June 23, 2005**

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50 *Social network as a moderator of gender differences in employment among drug court participants*  
M. Staton Tindall, J.L. Duvall, C.G. Leukefeld, J.M. Webster and T.F. Garrity  
University of Kentucky, Lexington, KY

55 *Differential predictors of return-to-custody among male and female parolees from prison-based therapeutic community substance abuse programs*  
W.M. Burdon, N.P. Messina and M.L. Prendergast  
University of California, Los Angeles, CA

#### **ADOLESCENTS: MARIJUANA AND NICOTINE USE AND ABUSE**

63 *Understanding gender differences in drug use by considering drug-exposure opportunities*  
K.M. Green and M.E. Ensminger  
Johns Hopkins University Bloomberg School of Public Health, Baltimore, MD

70 *Relative power and marijuana use within adolescent sexual partnerships*  
P.A. Matson and J.M. Ellen  
Johns Hopkins University and Johns Hopkins School of Medicine, Baltimore, MD

#### **NICOTINE – HUMAN STUDIES**

84 *Menstrual phase effects on psychological motives for smoking*  
A.M. Allen and S.S. Allen  
University of Minnesota, Minneapolis, MN

85 *Gender and ethnic differences in characteristics of smoking of callers interested in quitting smoking*  
J.L. Mason and D.K. Hatsukami  
University of Minnesota, Minneapolis, MN

86 *Acculturation, smoking, and nicotine dependence among African American women*  
A.F. Fernander  
University of Kentucky, College of Medicine, Lexington, KY

91 *Establishing smoking-abstinence cutoffs using expired carbon monoxide among female prisoners*  
K.L. Cropsey, G.C. Villalobos, M.F. Weaver and M.L. Stitzer  
Virginia Commonwealth University, Richmond, VA and Johns Hopkins University, Baltimore, MD

- 96 *Newer smokeless tobacco products compared to medicinal nicotine: Health and behavioral consequences*  
M.I. Mendoza-Baumgart and D.K. Hatsukami  
University of Minnesota, Minneapolis, MN

**EPIDEMIOLOGY**

- 99 *Illegal drug use in Peru: Recent epidemiological estimates*  
M. Piazza, F. Salazar, G.F. Alvarado, R. Durand, A. Lescano, D. Blichtein and E. Nunez  
Universidad Peruana Cayetano Heredia, Lima, Peru and DEVIDA and Cooperacion Tecnica Belga, Lima, Peru
- 101 *Mortality in a cohort of opiate users at the Vienna Addiction Clinic*  
S. Bauer, R. Loipl, D. Gruber, R. Jagsch, D. Risser and G. Fischer  
Medical University of Vienna, Vienna, Austria
- 104 *Overweight, drug involvement, and other psychosocial problems among graduating seniors from a historically Black college*  
F.A. Wagner, S.M. Gross, P.A. Clubb and D.C. Browne  
Morgan State University, Baltimore, MD
- 106 *Childhood trauma among drug-involved, street-based sex workers in Miami*  
J.C. Weaver, C.E. Spadola and H.L. Surratt  
University of Delaware, Coral Gables, FL
- 107 *Drug-involved sex workers formerly placed in foster care*  
C.E. Spadola, J.C. Weaver and J.A. Inciardi  
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**POLYDRUG: ABUSE/DRUG INTERACTION**

- 126 *Predictors of therapeutic response to contingent fee rebates during outpatient treatment of opioid dependence*  
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Friends Research Institute, Inc., Los Angeles, and Aegis Medical Systems, Agoura Hills, CA
- 127 *Behavioral economic analysis of naturalistic heroin demand*  
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141 *Women in long-term relationships with drug-using men: The experiences of Indo-Trinidadian women*

M. Mahadeo

Medical and Health Research Association of New York, Inc., Columbia University, New York, NY and Caribbean Health Research Council, St. Augustine, Trinidad and Tobago

150 *Frequency of marijuana use predicts retention and treatment outcome in office-based buprenorphine treatment for opioid dependence*

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Yale University School of Medicine, New Haven, CT

**Oral Communications XXI**

**England**

**9:30 – 11:30 AM**

**GROWING PAINS: DRUGS IN ADOLESCENTS**

Chairs: Jody L. Kamon and Stephen Magura

9:30 *Drug-dealing and recent-onset cannabis users in the U.S, 2003: A re-approach based on a nationally representative sample of 1,244 youths*

C.P. Obando, C.F. Ríos-Bedoya and J.C. Anthony

Michigan State University, East Lansing, MI

10:30 *Gender, adolescent substance-use disorders, and young-adult personality-disorder outcomes*

D.L. Thatcher and D.B. Clark

University of Pittsburgh, Pittsburgh, PA

11:00 *Prevalence and correlates of withdrawal in adolescents presenting for substance-abuse treatment*

J.L. Kamon, A.J. Budney, M.L. Dennis and R.R. Funk

University of Vermont, Burlington VT and Chestnut Health Systems, Bloomberg, IL

**Oral Communications XXII**

**Ireland**

**9:30 – 11:30 AM**

**GENES: IT'S A SMALL WORLD AFTER ALL**

Chairs: Joshua M. Gulley and Mary Jeanne Kreek

10:00 *A gene-gender interaction in basal cortisol levels in normal human volunteers: Role of the A118G SNP of the mu opioid gene (OPRM1)*

G. Bart, L. Borg, C. Lilly, A. Ho and M.J. Kreek

The Rockefeller University, New York, NY



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10:15 *Ethnic- and gender-specific association of the nicotinic acetylcholine receptor alpha 4 subunit (CHRNA4) gene with nicotine dependence*  
M.D. Li, J. Beuten, J.Z. Ma, T.J. Payne, X.Y. Lou, K.M. Crews and R.C. Elston  
University of Texas Health Science Center at San Antonio, TX, University of Mississippi Medical Center, Jackson, MS and Case Western Reserve University, Cleveland, OH

10:30 *Genetic and environmental contributions to amphetamine use in a national twin sample*  
M.T. Lynskey, A.C. Heath, E.C. Nelson, K.K. Bucholz, P.A.F. Madden, W.S. Slutske, D.J. Statham and N.G. Martin  
Washington University School of Medicine, and University of Missouri, St. Louis, MO, Queens Institute of Medical Research, Brisbane, Australia

**Oral Communications XXVI**

**Crown Hall  
2:15 – 4:15 PM**

**PAIN AND ANALGESIA**

Chairs: Charles D. Cook and Anna Bordosi

2:30 *Nociceptive sensitivity in male and female rats using a model of tonic pain*  
C.D. Cook  
Virginia Commonwealth University, Richmond, VA

**Symposium XVIII**

(No abstracts are available for these presentations)

**Scotland  
2:15 – 3:15 PM**

**SMOKING AND WOMEN: THE INFLUENCE OF MENSTRUAL CYCLE**

Chairs: Sharon Allen

2:15 *Relapse to smoking in women: Role of the menstrual cycle*  
Sharon Allen  
University of Minnesota Medical School, Minneapolis, MN

2:35 *Variations in nicotinic acetylcholine receptor expression across the menstrual cycle: A brain mechanism mediating variations in smoking behavior*  
Julie Staley  
Yale University School of Medicine and VA Connecticut Healthcare System, West Haven, CT

2:55 *Menstrual cycle phase at quit date: Effect on treatment outcome, irrespective*

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**Thursday, June 23, 2005**

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*of treatment modality*

Discussant: Teresa R. Franklin

University of Pennsylvania and VA Medical Center, Philadelphia, PA



## ABSTRACTS

### **Effect of prenatal cocaine exposure on examiner-rated behavior at age 7: Pathways involving caregiver behavioral health**

**V.H. Accornero, J.C. Anthony, C.E. Morrow, L. Xue and E.S. Bandstra**

*University of Miami School of Medicine, Miami, FL and Michigan State University, East Lansing, MI*

**Objective:** To examine whether caregiver drug use and psychological problems mediate the suspected relationship between prenatal cocaine exposure and aspects of child behavior as rated in a clinic setting when the children were 7 years of age. **Design/Methods:** Data were collected as part of the ongoing longitudinal Miami Prenatal Cocaine Study (MPCS). 476 African-American full-term infants (253 cocaine-exposed, 223 non-exposed) were enrolled prospectively at birth and assessed serially through age 7. Here, initial analyses are based on 407 children (212 cocaine-exposed, 195 non-exposed) participating in the 7-year neuropsychological assessment. Trained psychometricians completed a behavior rating form that assessed two primary dimensions of child behavior as observed during the structured testing session: behavioral regulation (BR) and sociability (SOC). Caregiver drug use and psychological problems were assessed using a modified version of the Addiction Severity Index (ASI). **Results:** When BR and SOC were regressed simultaneously on a covariate term for prenatal cocaine exposure while holding constant child sex and prenatal exposure to alcohol, tobacco, and marijuana, the estimates indicated that cocaine-exposed children were an estimated 0.2 to 0.3 SD lower on BR (estimated slope  $B = -0.3$ ;  $p = 0.04$ ), with no SOC difference ( $p > 0.4$ ). Contrary to our expectations, neither postnatal drug use by caregivers nor the severity of their psychological problems were related to levels of child BR or SOC ( $p > 0.10$ ), although caregiver drug use level (but not caregiver psychological problems) was predicted by mother's use of cocaine during pregnancy under this model ( $B = 0.6$ ;  $p < 0.05$ ). **Conclusions:** There is a direct path linking prenatal cocaine exposure to examiner-rated behavioral regulation (but not sociability). This relationship does not appear to be mediated by levels of caregiver behavioral health, as conceptualized and measured for this study.

**Acknowledgments:** K01 DA 16720-02; R01 DA 06556-13; M01 RR 16587- 03

### **Assessing sex differences on treatment effectiveness from the drug abuse treatment outcome study**

**S. Acharyya and H. Zhang**

*Brown University, Providence, RI and Yale University, New Haven, CT*

Men and women entering drug treatment programs are known to differ in demographic characteristics and psychosocial behavioral patterns. To be effective, any such program that caters to individuals from both sexes, should be able to identify and address these gender-based variations. Studies have also reported clinical differences in the effect of drugs on men and women addicts. Here, we try to examine if the treatment is equally effective on men and women, when several demographic covariates are controlled. We construct a "problem severity index (PSI)" to categorize individuals based on how acute their problem was at the start of the program. We also examine how the choice of treatment modality affects treatment success. Exploratory analysis is carried out through the use of odds ratios, followed by more formal testing, carried out in the framework of cumulative logit models. Sex does not appear to be a significant factor ( $p$ -value=.18) when other explanatory variables are controlled for, but the choice of treatment modality certainly does ( $p$ -value  $< .0001$ ). The analysis is based on a total of 10010 participants (66% male, 47% African American, 13% Hispanic) with a mean age of 33 years. Four waves of interviews were conducted. The number of participants at baseline was 10,010 (spread over 96 sites in 11 mid-size and large US cities). Several analyses were done. The most conservative of these analyses had 2996 cases with complete follow-up.

### **Childhood physical and sexual abuse as risk factors for substance dependence**

**S.E. Afful, J.R. Kleinheider, L.B. Cottler and L.J. Bierut**

*Washington University School of Medicine, St. Louis, MO*

Childhood abuse and trauma are linked to substance dependence later in life. Physical abuse, sexual abuse, and placement in foster care during childhood were examined as risk factors for substance dependence as part of the Family Study of Cocaine Dependence. Individuals were recruited through substance treatment centers, the driver's license registry, and as siblings of index cases. The total sample consisted of 1623 participants (58.8% African-American, 40.9% male). All subjects were examined using a semi-structured assessment of substance dependence and other psychiatric disorders. Women were more likely than men to be sexually abused (20% vs. 5%,  $p < .001$ ) and placed in foster care (4% vs. 2%,  $p < .05$ ) while men were more likely to be physically abused (39% vs. 32%,  $p < .01$ ). There were no significant ethnicity differences in the rates of abuse. Participants who experienced any type of abuse in childhood were more likely than those not abused to be dependent on tobacco (57% vs. 38%,  $p < .001$ ), alcohol (47% vs. 33%,  $p < .001$ ), marijuana (35% vs. 21%,  $p < .001$ ), cocaine (53% vs. 38%,  $p < .001$ ), and other substances (28% vs. 16%,  $p < .001$ ). Physical abuse, sexual abuse, and foster care were entered separately for men and women into multiple logistic regression analyses for dependence. Men who were physically abused were 1.68 times more likely to be alcohol dependent ( $p < .001$ ), 1.98 times more likely to be cocaine dependent ( $p < .001$ ), and 1.65 times more likely to be dependent on other illicit drugs ( $p < .01$ ) compared to men who were not abused. Sexual abuse and foster care were not significant predictors for men. Physical abuse, sexual abuse, and foster care all significantly increased the risk for women to be dependent upon alcohol (ORs: 1.71, 2.01, 2.03, respectively,  $p < .05$ ) and cocaine (ORs: 1.84, 2.28, 2.13, respectively,  $p < .05$ ). Consistent with previous literature, childhood trauma increases the risk for drug dependencies for both men and women and it appears that women who experience childhood abuse may be at an even greater risk for the development of dependence. Supported by NIDA grant DA13423-05.

### **Menstrual phase effects on psychological motives for smoking**

**A.M. Allen and S.S. Allen**

*University of Minnesota, Minneapolis, MN*

Studies have shown that there are gender differences in smoking cessation; women have a more difficult time quitting smoking than men, they are less confident in their ability to quit and are less successful in maintaining an initial quit. These differences may be attributed to the hormone fluctuations women experience across their menstrual cycles. This study hypothesized that women in the late luteal (LL) phase of their menstrual cycle would have higher psychological motives for smoking than women in the follicular (F) phase. Data was collected from an ongoing study looking at the effects of the menstrual cycle on smoking relapse. Subjects ( $N=111$ ) completed the Wisconsin Inventory of Smoking Dependence Motives (WISDM-68) at two clinic visits prior to their quit date and their current menstrual cycle phase was recorded. Subjects had an average age of 29.8 (S.D.  $\pm$  6.3) years old, smoked a mean of 16.7 (S.D.  $\pm$  6.1) cigarettes per day, and had an average Fagerstrom score of 3.9 (S.D.  $\pm$  2.0). Analysis of variance (ANOVA) tests were performed to compare the differences in the 13 sub scales of motives for drug use and total WISDM-68 scores by menstrual cycle phase at the time they filled out the questionnaire. No significant differences were found in sub scale or total scores. However, differences between subjects in the F phase and subjects in the LL phase approached significance for the following: Craving sub scale (4.5 v. 5.1 respectively,  $p=0.070$ ), Positive Reinforcement sub scale (4.0 v. 4.6 respectively,  $p=0.077$ ), Automaticity sub scale (3.7 v. 4.5 respectively,  $p=0.086$ ) and total WISDM-68 score (4.1 v. 4.5 respectively,  $p=0.088$ ). These data suggests that women in the LL phase may experience more intense urges to smoke, an enhanced positive feeling from smoking, and may have higher automatic smoking processes. More research is needed to investigate the relationship between smoking and the menstrual cycle. NIDA 5R01DA08075-10

### **History of physical abuse and problem drinking and drug use in pregnant women**

**A.H. Alvanzo, L. Keyser-Marcus and D.S. Svikis**

*Virginia Commonwealth University, Richmond, VA*

Background: A history of abuse has been associated with a number of physical and mental health consequences including substance use and dependence. The primary aim of this study was to examine the relationship between physical abuse and substance use in pregnant women. It was hypothesized that women with a history of physical abuse would report higher rates of alcohol and drug use. Methods: Self report

data was collected from 308 pregnant women presenting to an urban hospital-based OB/GYN clinic on their first prenatal visit. Women completed a battery of questionnaires that included the Abuse Assessment Screen, the Drug CAGE, the PAL substance use questionnaire and several measures of alcohol use, including the TWEAK. All women provided informed consent as part of a larger research study. Demographically, women were in their mid 20's (mean age 25.6, SD 5.70), single (67.4%), and predominantly Black (69.0%). Women were classified as Abuse + (N = 77) and Abuse - (N = 231), and the groups were compared using chi square analyses for categorical variables and student's t- test for continuous variables. Results: Using a cut point of  $\geq 3$  on the TWEAK, Abuse + women were more than twice as likely to report harmful drinking (42.1% vs. 19.4%,  $p = 0.001$ ) than Abuse - women. There was a similar trend when using the lower cut point ( $\geq 2$ ), but the difference was no longer statistically significant (59.6% vs. 44.4%,  $p = 0.056$ ). Abuse + women were more likely to have tried marijuana (75.7% vs. 41.8%), speed (9.9% vs. 2.7%), cocaine (31.9% vs. 6.8%), and opiates (18.1% vs. 4.1%) than Abuse - women ( $0.001 < p < 0.012$ ). Additionally, women with a history of physical abuse were more likely to have a + Drug CAGE score ( $\geq 2$ ) than nonabused women (35.6 vs. 11.3%,  $p < 0.001$ ). Implications: A history of physical abuse is associated with problem drinking and drug use. Study findings support the importance of screening for a history of abuse as a risk factor for prenatal alcohol and drug use. This research was supported by NIDA DA 11476 and NIAAA AA 11802.

### **Coping with stressful events: Influence of parental alcoholism and race in a community sample of women**

**M. Amodeo, M.L. Griffin, I. Fassler, C. Clay and M.A. Ellis**

*Boston University School of Social Work, Boston, MA*

Background: This study of a community sample of 290 white women and black women compared those with and without alcoholic parents to determine whether (a) coping methods varied by parental alcoholism status and race, and (b) coping was affected by childhood stresses and resources and adult resources. Methods: 1,124 screening interviews were conducted to derive a sample of 46% black women and 54% white women, 43% (126) of whom had alcoholic parents. The sample represented a range of ages, years of education, household income, and childhood socioeconomic status. Subjects blind to the study purpose completed standardized self-administered questionnaires and a face-to-face interview. Siblings served as collateral informants by completing questionnaires on parental drinking and other childhood stresses. Results: Women with negative childhood family environments including alcoholic parents and a lack of adolescent social support more often reported avoidant coping. Black women also more often reported avoidant coping although they used one approach coping method, prayer, more often than did white women. However, all childhood stresses and resources combined were only moderately successful in predicting adult coping responses. Strong self-esteem, considered a coping resource, was associated with a higher score on active cognitive coping, a lower score on avoidant coping, higher scores on logical analysis and problem solving, and lower scores on emotional discharge. Conclusion: Future research should examine whether women who use avoidant coping to address life stresses are actually less functional than women who use approach coping or whether avoidant coping is adaptive under some circumstances.

### **Cocaine and stress reactivity: Subjective and physiological gender differences**

**S.E. Back, K.T. Brady, J.L. Jackson, S. Salstrom and H. Zinzow**

*Medical University of South Carolina, Charleston, SC and University of Georgia, Athens, GA*

Recent investigations suggest that stress reactivity may play an important role in the relationship between stress and substance use. Important gender differences, such as reasons for using substances, have been well documented, and it is likely that men and women also differ in their stress response. In this study, gender differences in stress reactivity to two laboratory stress manipulations were examined among 18 men and 21 women with current cocaine dependence. Participants completed a psychological stress task, the Mental Arithmetic Task (MAT), and a physical stress task, the Cold Pressor Task (CPT). Subjective stress responses (i.e., feelings of stress, anxiety, nervousness, pain, mood), physiological stress responses (i.e., heart rate, skin conductance), and cocaine craving were assessed. In response to both the MAT and the CPT, significant increases in subjective and physiological stress were observed among participants. Women, however, demonstrated greater subjective reactivity, as evidenced by significantly higher ratings of stress, nervousness, and pain as compared to men. Women also immersed their hand in the cold water

bath for a significantly shorter period of time as compared to men. The current findings are among the first to report on gender differences in stress reactivity among cocaine dependent individuals. The findings suggest that the mechanisms linking stress and substance use may be gender-specific, and that stress reactivity may play a different role for women than for men. Future research and implications for clinical interventions are discussed. Acknowledgment: This work was supported by Grant DA006077 awarded to Sudie Back.

### **Gender difference in the prevalence and the severity of white matter hyperintensities in methamphetamine users**

**S.C. Bae, I.K. Lyoo, Y.H. Sung, S.J. Bae, A. Chung, J. Hwang, M.Y. Sim, J. Kim and P.F. Renshaw**

*Seoul National University College of Medicine and Hospital, Seoul, Korea and McLean Hospital Brain Imaging Center, Belmont, MA*

Background: Despite the absence of prior report, increased white matter hyperintensities (WMH) may exist in methamphetamine (MA) users, as MA has been reported to be related to cerebral perfusion defects and other neurotoxicity. Gender difference in neurotoxic and vascular effects of MA has also been reported. Authors hypothesized that MA users would have increased prevalence and severity of WMH and that this finding would be more prominent in male MA users than female MA users. Method: Thirty-three MA user and 32 age- and sex- matched healthy comparison subjects were scanned with using a 3.0 Tesla GE whole body imaging system. Axial T-2 weighted images were obtained as well as Fluid Attenuated Inversion Recovery (FLAIR) axial. The severity of WMH was assessed separately for deep (and insular) and periventricular WMH, using a composite version of the Fazekas' and Coffey's rating scales. Ordinal logistic regression models were used to assess the odds ratio for WMH by diagnosis, age and sex. Result: The MA group had greater severity of WMH than the healthy comparison group (odds ratio: 7.06, 8.46, and 4.56, for all, deep, and periventricular WMH, respectively,  $P$ 's<0.05). The frontal brain region was the predominant location (85.7%) of WMH in MA users. Male MA users ( $n=22$ ) had significantly greater severity of WMH (odds ratio=18.86,  $P<0.001$ ) than male comparison subjects ( $n=21$ ). In contrast, there was no significant difference in WMH severity (odds ratio=1.18,  $P=0.883$ ) between female MA users ( $n=11$ ) and female comparison subjects ( $n=11$ ). Conclusion: We report an increased prevalence and severity of WMH in male, but not female, MA users. Our finding suggests that male MA users frequently have cerebral microvascular changes. This gender difference may potentially be due to estrogen, which has a protective effect against neurotoxic effect of MA and cerebral vascular changes.

### **Comparing pregnancy outcomes and cost efficacies of an aggressive outreach and referral programs for substance-abusing women**

**U.O. Bailey, R.J. Harrison, A.L. English, R. Cox, D. Farr and B. Vayhinger**

*Howard University, Washington, DC, Prince George's Hospital Center, Healthy Babies and Center for Addiction and Pregnancy, Cheverly, MD*

Substance abuse during pregnancy can contribute to serious complications and health risks for both mothers and infants before and after delivery. This study compares the clinical outcomes and cost efficacies of two alternative prenatal and postnatal comprehensive drug abuse treatment and intervention programs in the Washington, DC metropolitan area for mothers who delivered between January, 1996 and December, 2000. One center ( $n=465$ ) engages in aggressive outreach to high-risk pregnant women. The second serves women referred by hospitals, clinics, social workers and physicians for treatment and intervention. The results show (all  $p < .05$ ) that despite serving younger (34% under 20, vs. 8%) and less educated (51% <HS vs. 28%) women, those in the aggressive outreach program were more likely to have their first prenatal visit in the first trimester (59% vs. 24%), and were less likely to deliver premature (14% vs. 24%) or low birth-weight (13% vs. 19%) babies than those in the referral program. Regressions confirm that these more favorable outcomes do not reflect differences in the social or demographic characteristics of the women at the two centers, the nature of their dependencies, or differences in prenatal care or medical problems prior to entering the programs. Instead, decomposition analysis show the differences would be even larger if the referral program served the higher risk population in of the aggressive outreach program. The paper will also use regressions of treatment codes on outcomes for patients at PG county hospital, decomposition

analysis techniques and the cost structures for the two programs to estimate the size of the savings the aggressive outreach program achieves through these improved outcomes.

### **Assessment of recent maternal cocaine use in a longitudinal study of prenatal cocaine exposure**

**E.S. Bandstra, V.H. Accornero, L. Xue, C.E. Morrow, V. Moodley and J.C. Anthony**

*University of Miami School of Medicine, Miami, FL and Michigan State University, East Lansing, MI*

Background: This presentation focuses on maternal self-report and toxicology assays performed at the 12-year visit of the Miami Prenatal Cocaine Study (CPS), a longitudinal study of the effects of in utero cocaine exposure on child outcomes. Chronic drug use by the mother when she is in a primary caregiving role may influence child outcomes. Objective: To determine the prevalence of recent maternal cocaine use by self-report, urine assay, and hair assay in a high-risk, inner-city sample of mother-child dyads participating in the 12-year visit of a longitudinal follow-up of prenatal cocaine exposure. Methods: The originating Miami PCS sample had 476 mother-infant dyads (253 were prenatally cocaine-exposed and 223 were non-cocaine-exposed, as determined by postpartum maternal interview, maternal urine, and infant urine and meconium). Serial neurodevelopmental assessments have been completed in 87% of the sample through age 7. To date, 163 biological mother primary caregivers have been assessed with a modified Addiction Severity Index and urine and hair assays at the 12-year child development follow-up visit. Positive cocaine and/or metabolites were confirmed by GC/MS (US Drug Testing Laboratory, Des Plaines, IL). Results: Of the 70 mothers who used cocaine during pregnancy, positive cocaine results were found at the 12-year visit by self-report in 27%, urine in 50%, hair in 60%, and at least one method in 69%. Of the 93 mothers who did not use cocaine prenatally, positive cocaine results were found at the 12-year visit by self-report in 8%, urine in 15%, hair in 31%, and at least one method in 34%. Conclusion: These preliminary results support the need to include combined self-report and biological markers in the assessment of recent maternal drug use in longitudinal follow-up studies of in utero cocaine exposure. Acknowledgement: R01 DA 06556-13; K01 DA 16720-02; R01 DA 15906-03 S1; M01 RR 16587-03.

### **A gene-gender interaction in basal cortisol levels in normal human volunteers: Role of the A118G SNP of the mu opioid gene (OPRM1)**

**G. Bart, L. Borg, C. Lilly, A. Ho and M.J. Kreek**

*The Rockefeller University, New York, NY*

The mu opioid receptor is critical to the development of the addictive diseases. We have shown that the frequently occurring A118G polymorphism in exon 1 of OPRM1 is associated with both heroin addiction and alcoholism. We previously showed that the amino acid substitution encoded by the variant, 118G, allele alters receptor function. Because the mu opioid receptor modulates the stress responsive hypothalamic-pituitary-adrenal axis, we hypothesize that the A118G SNP will influence stress responsivity. We analyzed morning levels of plasma ACTH and cortisol over 90-minutes following iv saline placebo infusion in normal volunteer subjects (33 male; 25 female) with no DSM-IV diagnoses of substance dependence or other axis 1 disorders with respect to the A118G SNP (A118A n=38, 20 male, 18 female; A118G n=20, 13 male, 7 female). A 2-way ANOVA of the area under the curve for each hormone, gender x genotype was used, followed by a Newman-Keuls post hoc test. There was no significant difference in levels of ACTH or cortisol between male and female subjects across genotypes. However, subjects with a 118G allele had greater levels of cortisol than did the A118A subjects ( $p < 0.01$ ). There was a significant gender by genotype interaction ( $p < 0.05$ ), with female 118G subjects having greater cortisol levels than any other group ( $p < 0.02$ ). Two studies have found an increased response in stimulated cortisol following naloxone challenge in subjects with a 118G allele, but neither found genotype to influence basal cortisol levels; neither studied genotype-gender interactions (one studied only males). There have been no reports of differences in A118G allele frequency between genders. Some investigators have observed gender differences in vulnerability to specific addictions. Our exciting preliminary finding of a potential gene-gender effect of the A118G variant of the mu opioid receptor may have important implications in the study of the addictive diseases, pain, and neuroendocrinology. Supported in part by grants DA-P60-05130, DA00049 and M01- RR00102.

### **Critical periods for the effects of toluene exposure on developmental delays in rats**

**J.C. Batis, J.H. Hannigan and S.E. Bowen**

*Wayne State University, Detroit, MI*

The increase in women of childbearing years that report abusing inhalants has led to concern about the possible deleterious effects of prenatal binge exposure to the developing fetus. Little is known about differences in offspring outcome following binge exposure to high doses of abused inhalants as a function of the relative gestational stage at time of exposure. This research evaluated the effects of prenatal or neonatal binge exposure to toluene, one of the most commonly abused inhalants. Utilizing a rat model of inhalant abuse (repeated, brief, high-dose exposures), timed-pregnant Sprague Dawley rats were exposed to toluene from gestation day 8 (GD8) to GD20 (2nd trimester equivalent in humans). Other whole litters of rat pups were exposed from postnatal day 4 (PD4) to PD10 (3rd trimester equivalent). Dams or litters were exposed twice daily to air or toluene (8000, 12,000, or 16,000 ppm). Offspring were tested before weaning (on PN21) using a developmental test battery that included body weight, negative geotaxis, surface righting and grip strength assays. For animals exposed to toluene neonatally, testing occurred before the first exposure on a given day. Offspring exposed prenatally to toluene exhibited greater behavioral deficits than pups exposed neonatally. Pups from both exposure groups exhibited decreased growth during their respective periods of toluene exposure, with the differences becoming non-significant by weaning (PN21). This research suggests that toluene exposure during the 2nd trimester produces greater impairment of offspring development than when similar exposures occur during the 3rd gestational trimester equivalent. Further research will examine the effects of binge toluene exposure during the 1st trimester, as well as across multiple trimesters. (Supported in part by grants DA15095 and DA015951 to SEB).

### **Mortality in a cohort of opiate users at the Vienna Addiction Clinic**

**S. Bauer, R. Loipl, D. Gruber, R. Jagsch, D. Risser and G. Fischer**

*Medical University of Vienna, Vienna, Austria*

Rising numbers and rates of fatal heroin associated overdose mortality have been reported within the last twenty years. We investigated the mortality rate in a cohort of 269 opioid dependent patients (DSM-IV) who were treated and discharged during a time frame (1998-1999) from the Addiction Clinic, Medical University Vienna to General Practitioners on long-term prescription for synthetic opioids. Participants were followed-up after a mean of 71 months (SD=12). Structured Interviews and urinalysis at time of interview were investigated as well as autopsy findings from deceased patients. We received information from 147(55%) patients. Thirty three (12%) patients could not be interviewed (left area), 122(45%) could not be located (but alive according to death register) and 29(11%) patients died. Finally 85 patients (32%), 46 males, 39 females were interviewed, 77% (n=65) have still been enrolled in ongoing maintenance therapy, Forty patients have taken oral slow release morphine (mean dose: 690mg), 17 methadone (mean dose: 70mg) and 8 buprenorphine (mean dose: 4mg), 19% (n=16) have been drug free and 5% (n=4) sledged back to drug dependence Gender differences concerning professional training, health problems, drug misuse and in psychiatric status were revealed. Women scored significant lower in all categories except professional training resulting in a better outcome ( $p<0.001$ ). From the 29 fatalities (21 male, 8 females), 38% (n=11) died due to overdosing with illicit substances, 35% (n=10) related to AIDS and 28% (n=8) on somatic reasons. The Standardized Mortality Ratio was 27.20 (95%CI=17.73-41.73). Being male, having a higher lifetime frequency on hospitalization, less working days and a lack in social relationships were associated with significant high mortality. Four of the deceased patients were enrolled in opioid maintenance therapy when dying. Our study confirmed the high mortality rate and data support the importance of maintenance. However it needs to be emphasized that we were unable to locate 45% of the target groups, although six times invitation letters were posted.

### **Economic predictors of ecstasy consumption and related problems in a general community sample**

**A. Ben Abdallah, L.M. Scheier, J.A. Inciardi, J. Copeland and L.B. Cottler**

*Washington University, St. Louis, MO, LARS Research Institute, Las Vegas, NV, University of Delaware, Coral Gables, FL and National Drug and Alcohol Research Center, Sydney, Australia*



Becker's 1988 theory of rational behavior proposes that economic factors decisively regulate behavior. Extensions of this framework suggest that drug consumption is influenced by economic factors as well. Coupled with an economic model, psychological explanations, in particular, value discrepancy and utility theories articulate that certain factors reflecting perceived difficulty or ease of obtaining a product (opportunity costs) influence activities leading to drug procurement. The confluence of both economic and psychological models suggests that drug consumption and behavioral sequelae need to incorporate purchase factors (e.g., price and availability), which serve as motivational cues fueling consumption. The present study used latent-variable structural equation modeling with data obtained from three independent community samples of ecstasy ("MDMA") users (St. Louis N=297, Miami N=186, Sydney, Australia N=129) to examine the influence of indicators of social anomie (e.g., poverty level), time spent acquiring drugs (opportunity cost), and unit price (monetary cost) along with known measures of psychosocial risk on self-reported ecstasy use. Findings indicated that unit price ( $r = -.21, p < .001$ ) and time spent acquiring drugs ( $r = .19, p < .001$ ), but not income, were optimal predictors of consumption. A model controlling for psychosocial risk also indicated significant roles for depression, drug motivation, and sexual risk-taking. Multiple group comparison procedures contrasted models for male and female participants as well as by age. Findings from this study highlight the important regulatory function of economic predictors and point toward possible intervention and treatment foci that have been previously ignored as components of our national public health agenda in the War against Drugs. (Grant number DA14854, Cottler, PI)

### **The influence of family support on drug-use trajectories of minority female addicts**

**R.E. Brisgone**

*Rutgers University School of Criminal Justice, Newark, NJ*

Drug-using patterns of even the most chronic female drug users can change in response to critical life events. This study focuses on behavioral outcomes of minority female prostitutes at the extreme edge of the drug-using continuum -- a much under-researched population. It combines qualitative data collection, which is highly successful for reaching such hidden populations, and longitudinal methodology to focus on the changing dynamics of drug use in relation to criminal offending and changing life circumstances. It hypothesizes that drug-use trajectories of even these most chronic female addicts are sensitive to changing conditions of family social support. Subjects were recruited from an urban prostitution "stroll" in New Jersey known for heroin and cocaine-using sex workers. Twenty-seven subjects (sub-sampled from 91) were interviewed repeatedly over 36 months. For each subject, multiple interviews were collapsed into a behavior summary, subdivided into chronological "periods" of low, medium, high, and abstinent drug-use, and coded for prostitution activity, critical life events, and changing social circumstances. Results show that "time outs" from drug use (whether jail terms, drug treatment, or health crises) when accompanied by improvements in family relations can lead to better behavioral pathways. Conversely, such interruptions without added family supports more often lead subjects back to regular drug use and criminal acts. For example, after a 17-month jail term, one subject got a job, and entered methadone treatment -- stopping heroin and prostitution for 15 months, and tapering off other addictions. Her transformation occurred as her mother housed, fed, and got her daughter off to work each day in exchange for a pledge to seek a drug-free life. Yet, another subject who spent 5 months in jail, and was released on orders to enter long-term drug treatment, relapsed in a week and resumed prostitution. She had only a drug-addicted prostitute sister for shelter; her relapse was predictable. Findings suggest that treatment policy makers can capitalize on these "time outs" and structure treatment to include helping families who provide support to recovering female addicts.

### **Differential predictors of return-to-custody among male and female parolees from prison-based therapeutic community substance abuse programs**

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The purpose of this study is to determine differential predictors of recidivism among male and female parolees from prison-based therapeutic community (TC) substance abuse programs (SAPs). California's initiative to provide TC treatment to state prison inmates is the largest of its kind in the nation, if not the world. It also represents the largest effort to date to provide TC treatment to female inmates. Previously, most prison-based TC treatment programs treated only male inmates, and thus have yielded findings that

might be considered male-specific. This study seeks to separately identify and then compare factors that predict 12-month return-to-custody rates for male and female parolees from prison-based TC SAPs. Intake assessment data was collected on selected demographic, psychosocial, substance use, and criminal history variables from 25,981 inmates (16,505 males and 9,476 females) entering 18 prison-based TC SAPs in California as part of a 5-year process evaluation of these programs. Returned-to-custody (RTC) data on parolees was obtained from the Offender Based Information System (OBIS) maintained by the California Department of Corrections (CDC). Preliminary analyses indicated that female inmates were returned to custody within 12-months of release at significantly lower rates than male inmates (16% and 27%, respectively). However, this was due primarily to a significant difference in RTC rates between all female parolees and male parolees from higher-security male prisons (16% and 43%, respectively). Separate logistic regression analyses will be performed to determine if predictors of 12-month RTC among male parolees (and specifically among high-security male parolees) differ from predictors of 12-month RTC among female parolees from prison-based TC SAPs. The results of this study may provide valuable information for treatment providers with respect to developing curriculums that more directly address the unique needs of both male and female inmates in these programs.

### **Parent gender moderates relations between parent psychopathology, parenting, and child psychopathology in substance-abusing families**

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Child behavioral and emotional problems predict later substance use and abuse. Parent psychopathology and negative parenting are predictors of child problems in substance abusing families. However, the way in which parent psychopathology and negative parenting impact child problems may differ according to the gender of the substance-abusing parent. Participants included 242 parents receiving treatment for substance dependence who took part in a study of the effects of parent substance abuse on a range of child outcomes. Parent Internalizing, Parent Externalizing, and Negative Parenting composite variables were computed by standardizing then summing subscales from the Beck Depression Inventory, the Brief Symptom Inventory, and the Alabama Parenting Questionnaire. We used CBCL Internalizing and Externalizing broad-band syndromes as child outcome variables. Pearson correlations among the parent variables and child outcomes showed that all 3 parent variables were significant predictors of Child Internalizing and Child Externalizing. Structural equation modeling was used to estimate a series of models and test whether relations between parental psychopathology, negative parenting, and child psychopathology varied by parent gender. The Gender Specific Model showed the best fit. This model indicates that parent internalizing problems are not an independent predictor of negative parenting or child psychopathology once relations among parent psychopathology are controlled. The model also suggests that direct relations between parent externalizing problems and child internalizing and externalizing problems are similar for substance-abusing mothers and fathers. In contrast, negative parenting mediates relations between parent externalizing problems and child psychopathology only among substance-abusing mothers. Findings that these relations differ across parent genders can inform prevention and/or treatment with substance-abusing mothers and fathers. Supported by NIDA DA10821 and F31DA017999.

### **Multivariate look at drug-dealing among multi-problem male youths in the US, CY2003**

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**BACKGROUND & AIM:** In a companion report, we conducted latent class analyses (LCA) to extend a SAMHSA report on female youths, in which drug dealing (DD) and other conduct problems (CP) were studied 1-by-1. Here, we complement the study of drug dealing among females with LCA on male DD in the context of other conduct problems. **METHODS:** Data are from public use files of NSDUH2003; 9,308 12-17 yr old community-dwelling males were sampled and answered standardized questions on six recently active CP: serious fighting (SF), group-fighting (GF), serious attack on others (SA), stealing something worth > \$50 (S\$50), dealing illegal drugs (DD), carrying handguns (CH). **RESULTS:** LCA analyses, via LatentGold software, disclosed a four-class best-fitting solution, with two low prevalence drug dealing classes. An estimated 3% of males were in a 'multi-problem' class, within which all of the listed CP were

quite common. Within this class, 66% were drug dealing; corresponding estimates were: SF & GF, 93%; SA, 82%; S\$50, 68%; CH, 62%. DD also occurred in an 'intermediate' multi-problem class (comprising 5% of all males), with the following CP frequency estimates: DD, 47%; SF, 36%; GF, 44%; S\$50, 29%; CH, 28%. An estimated 18% of males were members of a 'fighting' class; and an estimated 74% were in a 'minimal problems' class; within these two classes, fighting occurred, but other CP were rare. DISCUSSION: Whereas we found drug dealing among female youths in the US to be concentrated within a single rare 'multi-problem' subgroup (1.4% of females), among males we find DD to be prevalent within two somewhat larger subgroups (3% & 5% of males, respectively). The male-female difference is of scientific interest and has some public health implications, as does the multi-problem context of youthful drug dealing by both males and females. SUPPORT: NIDA D43TW005819, T32 DA07292, K05DA015799, MSU research funds.

### **Change in high-risk sexual behaviors between community and court-recruited female cocaine users in St. Louis**

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Drug courts were established in the late 1980's to manage a burgeoning growth in drug related arrests in the U.S. HIV prevention intervention efforts aligned with drug court participation have the potential to influence recalcitrant behaviors including high-risk sex and drug use. Program modalities include linking negative consequences with the behavior and simultaneously providing education and support for behavior change. Women from the St. Louis Female Diversion Court were recruited to supplement an existing NIDA-funded community-based HIV prevention intervention trial. The present study compared the NIDA standard intervention to a condition including the standard intervention plus four peer-delivered educational sessions using a pre-post design. The present analyses compares four-month changes in sexual behaviors among court (CT: N=365) and community (COMM: N=104) recruited cocaine-using women. Baseline demographic data indicated CT women compared to COMM were younger (36 vs. 39 years of age), less likely to be African American (70% vs. 91%), undereducated (29% vs. 46%), and more likely to report lifetime history of sex trading (74% vs. 41%). Proportional tests indicated few statistically significant group differences by condition at follow-up; however, both groups reduced high-risk sexual behaviors. Based on comparisons of community vs. court-referred women, both groups reduced (CT=27%, COMM=17%) or quit (CT=21%, COMM=15%) sex trading behaviors, and maintained low or reduced the overall number of sex partners (CT=70%, COMM=72%). Sexually active women increased their condom use (CT=12%, COMM=9%). Findings suggest that even the highest risk cocaine-using and sex trading women are willing to initiate healthier sexual behaviors to reduce their risk of HIV. Additional studies regarding maintenance of these behaviors are forthcoming and reinforce the need to examine longer term trends. (DA11622).

### **Changes in OxyContin® use among treatment seekers: Data from the DENS study**

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Introduction: OxyContin®, the brand name for oxycodone hydrochloride, is prescribed for the management of moderate-severe pain. The media has portrayed OxyContin® as more severe and addictive than other opiates, as attracting drug-naïve individuals, and as increasing in abuse. Methods: We evaluated these assertions using data from the Drug Evaluation Network System (DENS), an ongoing electronic system used to collect information from people presenting for substance abuse treatment. Results: Since 2001 DENS has collected data on prescription drug use/abuse from 27,825 patients entering treatment programs across the US. Here we report prevalence and describe users/abusers and change over time. We categorized "abusers" as those patients who reported using OxyContin® to "get a buzz or get high" (84% of all users). Prevalence – We found that 5% of the total sample reported some use of OxyContin® (n=1,397) and 2% (n=562) reported use in the past 30 days, 15% of those using every day and 31% using only 1 or 2 days. Who are the Abusers? Abusers were on average 9 years younger than non-abusers. Additionally, a greater percentage of users in the age groups 18-25 and 26-35 abused OxyContin® (95% & 90% respectively) whereas users in the older age groups were less likely be abusers (78% for those age 36 to 45, and 62% for those age 46 & older). Women were slightly more likely to have OxyContin® prescribed (25 vs. 20%, p<.05) and men were slightly more likely to use it to get high (87% vs. 83%, p<.05). Change over time –

We found a slight increase in the percent of patients who reported using OxyContin® over the 4 years reported; 2% reported use in 2001, 4% in 2002, 5% in 2003 and 6.4% reported use in 2004. Conclusions: A meaningful but small minority of patients reported OxyContin® use or abuse. Its use appears to be increasing in this sample of treatment seekers but there is no indication that OxyContin® abusers are more likely to be drug-naïve.

### **College students' perceptions of alcohol, marijuana and sexual activity: Formative research using focus groups**

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Among college students, rates of binge drinking have remained high for the past decade despite increased prevention efforts. In addition, marijuana use is increasing, and unprotected sex is commonplace. We used a formative research approach to identify the relationships between alcohol, marijuana and sexual behavior, and how drug use affects relational factors and sexual behaviors, in preparation for intervention development studies. We conducted four focus groups; participants were students who were sexually active and drank alcohol at a mid-sized urban university. 44 female students aged 18-25 participated in one of four 90-minute focus groups (n=9-13). 33 (75%) were White, 8 (18%) were Black, 2 (5%) were Latina, 1 (2%) was Asian Indian. Groups were conducted by two experienced facilitators and a recorder who took process notes for each group. All had graduate level training in qualitative methodology. One facilitated discussion while the other wrote responses on flip charts with the recorder providing a summary, process notations, and notable quotes for each question. Two investigators independently grouped all data into theme categories and reviewed them until reaching consensus. They were: 1) Women were more concerned about pregnancy than sexually transmitted diseases because "STD's can be treated." 2) Alcohol and drug use affects contraceptive behaviors with most women more likely to have unprotected sex when using drugs and alcohol. 3) The level of relationship influenced birth control practice, especially condom use, which was more likely with a new partner. 4) Women drank for the purpose of getting drunk and had mistaken ideas about tolerance and what constituted binge drinking. Data from two focus groups of college men will be added. Methods, themes and prototypical and outlier quotes will be provided. Preliminary conclusions are that binge drinking is normative and underestimated by college women, marijuana is often used in combination with alcohol, unprotected sex is more likely when alcohol and drugs are used, and qualities of the relationship affect safer sex decisions.

### **Gender difference in size and integrity of the fronto-striatal white matter tract in abstinent methamphetamine users: Diffusion tensor imaging and tractography study**

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Background: Potential gender difference in neurotoxic effects of methamphetamine (MA) has been suggested. Frontal cortex and striatum, two most vulnerable regions to neurotoxic effects of MA, are connected to each other by white matter (WM) tracts. The objective of our study was to explore the gender difference in MA-induced changes of size and integrity in the fronto-striatal WM tract. Methods: Diffusion tensor images of 30 abstinent MA users (22 male and 8 female) and 28 aged-and sex-matched healthy comparison subjects (20 male and 8 female) were acquired. 1) Fractional anisotropy (FA) map of each subject was produced by calculating the FA value, a scalar index of WM integrity. This was coregistered to his/her T1 image. 2) Using the in-house tractography application, bilateral fronto-striatal WM tracts were reconstructed on T1-coregistered FA maps by delineating the path of WM tracts passing both frontal and striatal seeding points. 3) Size and mean FA values of the fronto-striatal WM tract were compared between MA users and healthy comparison subjects. In addition, male and female MA groups and their respective gender-matched comparison groups were compared regarding the above measures in order to investigate potential gender differences. Results: 1) Both size and mean FA values of the right fronto-striatal WM tract were decreased in MA users relative to healthy comparison subjects ( $p < 0.01$ ,  $p = 0.04$ , respectively). MA users also had decreased size, but not mean FA values, of the left fronto-striatal WM tract ( $p = 0.02$ ). 2)

These impairment in the fronto-striatal WM tracts were found only in male, but not in female, MA users, when compared to their respective gender-matched healthy comparison subjects. Conclusion: Current finding suggests that the MA exerts more neurotoxic effect on fronto-striatal WM tracts in men than in women. Our finding of compromised fronto-striatal WM tracts, which connect the frontal cortex and striatum, may be related to craving or cognitive dysfunction observed in MA users.

### **Nociceptive sensitivity in male and female rats using a model of tonic pain**

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Clinical and preclinical evidence suggest that a chronic pain state can be associated with global alterations in nociceptive processing. However, it is not readily clear as to whether the pain caused by inflammation in the hindpaws in rats produces global alterations in nociceptive sensitivity that are sexually dimorphic. Thus, the present study was designed to identify sex differences in nociceptive sensitivity in rats in response to nociceptive stimulation of the hindpaws and tail, a region not directly affected by the arthritic state. Rats were injected with either Complete Freund's adjuvant (CFA) or vehicle directly into the right hindpaw on Day 0 with thresholds re-determined on Days 4, 6, 8, 10 and 11. Females developed mechanical hyperalgesia of the hindpaw at a faster rate than males (Day 4 vs. Day 8). Across all days of testing, males exhibited thermal hypoalgesia of the hindpaw, whereas females generally did not. CFA had little effect on tail-withdrawal latencies in male and female rats although latencies were generally shorter in vehicle treated females than males. Neither CFA treatment nor sex influenced tail pressure thresholds. On Day 18, when a polyarthritic state had developed, CFA treated females now exhibited thermal hypoalgesia of the hindpaw and the magnitude of hypoalgesia was greater in females than males. In male but not female CFA treated rats the polyarthritic state resulted in mechanical hypoalgesia of the tail. Taken together, these results demonstrate that sex differences in nociceptive sensitivity are, in part, dependent upon the pain state (mono vs. polyarthritic), the type of nociceptive stimulus (thermal vs. mechanical) and upon whether the stimulus is presented to the afflicted area (hindpaws) or a region not directly affected by the arthritic state (tail). During paw pressure testing on Days 4 and 11 the potency of morphine was increased in the CFA injected paw of both male and female rats with morphine being more potent in males than females. (Supported by NIDA Grant K12-DA14041 and VCU's Institute for Drug and Alcohol Studies)

### **Young people and alcohol: Taste perception, attitudes and experiences**

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The impact of ready to drinks (RTDs) on the drinking patterns of young people has not been established. In recent years a growing number of these products have become available and the proportion of Australian 15-17 year olds drinking pre-mixed spirits has increased from 6% to 22% for boys and from 10% to 37% for girls. There has been discussion that these drinks which are heavily promoted and marketed may introduce younger people to alcohol use. There is no scientific evidence of the comparative palatability of these beverages across age groups and gender and the potential impact on age of initiation to alcohol use. Aim: (1) To determine if RTDs are liked more by teenagers than comparable beverages; (2) whether this pattern changes with age; and (3) the extent to which packaging/marketing affects these likes and dislikes. Hypotheses: (1) Those aged under 18 years will have a stronger preference for the taste and aroma of the ready to drink preparations compared with wine, beer or spirits; (2) Girls aged under 18 years will demonstrate a stronger preference for RTDs than boys in that age group; (3) The non-blinded testing phase will demonstrate higher palatability rating for RTDs than blinded testing among those aged under 18 years; and (4) That those aged 18 years or older will be less likely to have self-initiated their alcohol with RTDs and at an older age than those aged less than 18 years. The sample consists of 70 participants in each of five age groups 12/13 year olds, 14/15 year olds, 16/17 year olds, 18-20 year olds and older adults (21-30 years). The palatability rating will be ascertained under blinded and non-blinded conditions. The participants rate the mixer beverage alone, the relevant RTD, and the associated alcoholic beverage alone. Currently 185 participants have been recruited and the initial mean palatability scores indicate that young people rate RTDs in a manner more similar to their rating of non-alcoholic beverages than alcoholic ones compared with adults. The final analyses will be presented and their relevance to the development of alcohol public health policy discussed.

**The influence of sex on the expression of beta2-nicotinic acetylcholine receptors using [123I]5-I-A-85380 SPECT**

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Preclinical and clinical evidence demonstrate sex and hormonal influences on tobacco smoking withdrawal, craving, and response to nicotine replacement therapy. It is well documented that chronic nicotine exposure in animals and tobacco smoking in humans results in an upregulation of the beta2-nAChR. Additionally, sex and sex steroid hormones have been shown to influence expression of the beta2-nAChR. The purpose of the present study was to determine if agonist binding to the beta2-nAChR varied according to sex in men and women, using [123I]5-IA-85380 ([123I]5-IA) and single photon emission computed tomography (SPECT). To date, fifteen healthy never smoker men and women (8 men and 7 women) aged 18-40 have been imaged. [123I]5-IA (10 mCi) was injected intravenously using a bolus to constant infusion ratio of 7.0 and three 30 min scans were acquired starting at hour 6. Women were imaged during the follicular phase of their menstrual cycle when estrogen and progesterone levels are low and this was confirmed by obtaining serum estradiol and progesterone levels on scan day. Preliminary analysis indicates that compared to men, women in the follicular phase of their menstrual cycle have significantly higher [123I]5-IA uptake, an 18-28% increase in cortical and subcortical regions. This is consistent with the preclinical literature that female rodents not exposed to nicotine had higher nAChR density and binding than males. It is likely that hormone fluctuations across the menstrual cycle underlie sex differences in nAChR expression. Understanding the molecular mechanisms related to sex differences in nAChRs may have profound implications for smoking cessation treatments in both men and women smokers. Support contributed by TTURC 5P50 DA 13334 and P50 AA15632 (SOM), RO1 DA015577 (JKS) and the Ethel F. Donaghue Women's Health Investigator Program at Yale.

**Characteristics of female cocaine users with access to firearms**

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In a NIDA-funded intervention study aimed at reducing HIV risk behaviors among 463 female crack/cocaine users in inner city St. Louis, a history of exposure to violence as both perpetrator and victim was assessed. In this context, 31% of women acknowledged exposure to firearms as a result of owning a gun, or having immediate access to one. Very little data are available from any subgroup, much less female crack/cocaine users, on gun ownership or access to firearms. In fact, in many States, drug users are prohibited from purchasing guns. Thus, these analyses, the first of their kind, describe and compare the characteristics of drug-using women by access to guns (i.e., either owners or those with immediate access). Females with access to guns were not differentiated by race, age, parental status, education, or arrest history; however, they were more likely, than those without access to guns, to report having more arguments that led to threats (O.R. = 3.23), physical abuse (O.R. = 2.70), and the use of weapons (O.R. = 2.36). In fact, they were more than twice as likely to have used a gun during an argument than females without access. Additionally, they were nearly six times more likely to have carried a gun. In terms of psychiatric status, females with access were more likely to have a diminished ability to think or concentrate, to have thoughts of death, and to meet criteria for antisocial personality disorder (ASPD), depression, posttraumatic stress disorder and gambling disorder. They were also more likely to report sex trading, as well as a history of childhood sexual abuse. When other variables were controlled for, ASPD and childhood victimization remained significantly associated with gun access. Female crack/cocaine users with a history of high-risk sexual behaviors, a history of childhood abuse and psychiatric illnesses that include mood swings, place themselves and others in danger when they have immediate access to a firearm. These data indicate an important area for assessment, intervention and education for future studies. (Grant #DA11622, PI, Linda B. Cottler)

## **Effect of handling on hormonal modulation of nociception and opioid antinociception**

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The purpose of the present study was to determine if periodic handling of rats before testing alters the effects of gonadal steroid hormones on basal nociception and opioid antinociception. Male and female Sprague-Dawley rats (N=7-10/group) were gonadectomized and implanted s.c. with capsules containing nothing (0) or testosterone (T, males and females) or estradiol (E2, females only). Once every 4 days for 28 days, rats were injected s.c. with 0.1 ml safflower oil (half rats in each hormone group: “handled”), or were left untouched in their home cages (“unhandled”). On the 28th day, nociception and morphine antinociception were tested on the hotplate and tail withdrawal tests. On the hotplate test, handled rats had slightly shorter hotplate latencies than unhandled rats, but this effect was not statistically significant. E2-treated females had significantly longer hotplate latencies than all other groups, regardless of whether or not they were handled before testing. In contrast, on the tail withdrawal test, only unhandled E2-treated females had longer latencies than the other groups. Among the males, morphine was significantly more potent in unhandled, T-treated rats compared to unhandled, placebo-treated rats, but only on the hotplate test; in contrast, there was no difference in morphine’s antinociceptive potency between handled, T- vs. 0-treated rats on either test. Among the females, there were no significant effects of handling on morphine’s potency in either T- or E2-treated rats. These results demonstrate that periodic handling before nociceptive testing does not consistently affect gonadal hormone modulation of nociception and opioid antinociception.

## **Establishing smoking-abstinence cutoffs using expired carbon monoxide among female prisoners**

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Previous research has suggested that self-reported smoking abstinence is unreliable, therefore the use of biological verification of smoking status has become standard in the field. However, even with biological measures, it is often difficult to determine appropriate cutoffs to indicate current smoking. Abstinence values using CO have been defined up to 8ppm in the literature and determining abstinence when conducting cessation studies is important because of demand characteristics that may promote dishonesty in self-report. The goal of this study was to determine an appropriate CO cutoff to indicate abstinence within a large sample (N = 378) of female prisoners incarcerated at a correctional facility in Virginia. Mean age of the population was 34.5 years, 49.2% were White, and 29% had less than a high school education. 72% were identified as smokers and 28% as non or ex-smokers by self-report. Smokers had significantly higher mean CO levels than nonsmokers (15.3ppm v. 0.5ppm;  $p < .001$ ). CO levels were examined as a function of self-reported smoking status using a receiver operator characteristic (ROC) analysis. A cutoff value of less than 2.5ppm indicated smoking abstinence, with an area under the curve of .99 (95% CI: .98 -.99) and a specificity and sensitivity of .97 and .98, respectively. This same cutoff was identified when examining separate ROC curves for Black and White women as well as light smokers (<5cpd and >60min since last cigarette; N =64), with similar specificity and sensitivity. Overall, a CO of 3ppm or less indicated smoking abstinence, even among nonsmokers in a high exposure second-hand smoking environment such as a prison. This suggests that using a higher CO cutoff may misclassify some smoking individuals as abstinent and may influence the outcomes of smoking cessation treatment studies.

## **Sex differences between young female and male Sprague-Dawley rats in response to methylphenidate**

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Adult females are reportedly more sensitive than adult males to psychostimulants such as cocaine, amphetamine, and caffeine. Yet, sex differences between young females and males in the behavioral responses to chronic treatment of the psychostimulant methylphenidate (MPD; Ritalin) have not been extensively investigated. Methylphenidate (MPD) is a common drug prescribed to treat attention deficit/hyperactivity disorder (ADHD), a behavioral disorder that begins in childhood and frequently

persists into adulthood. Because this drug is given to patients at a young age, differences in the response between young females and males warrant further investigation. The aim of this study was to investigate whether there are sex differences in the behavioral responses between young female and male rats that have been chronically exposed to MPD. Young male (N=32) and female (N=36) Sprague-Dawley (SD) rats were randomly divided into four groups receiving saline or 0.6, 2.5, or 10 mg/kg, i.p., MPD. These young rats received a daily injection of saline or one of the three MPD doses for six consecutive days followed by three days of washout and a rechallenge with saline or one of the three MPD doses as before. Changes in locomotor activity and stereotypic behavior were recorded and analyzed. Results showed that young female rats sensitized to repeated treatment of 2.5 mg/kg MPD, while their male counterparts failed to exhibit any sensitized effect to this drug dose. Furthermore, young female rats also displayed a higher level of locomotor activities in response to MPD treatment than young male rats, suggesting that female rats were more susceptible to the stimulating effect of MPD. Supported contributed by: NIDA-DA14441(P.B.Y.) and Pat Rutherford Chair in Psychiatry; MPD was a gift from Mallinckrodt.

### **Genetic strain, maternal environment, and biological sex interact to affect cocaine-induced taste aversions in Fischer and Lewis rats**

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The role of the maternal environment in the development of behavioral and physiological differences between rat strains suggests that epigenetic factors may contribute to or interact with differences ascribed solely to genes. In the present experiment, the role of such epigenetic factors in the differences between the F344 and LEW rat strains in the aversive effects of cocaine was examined. Specifically, male and female F344 and LEW pups were randomly assigned to be reared by either an unrelated dam of its own strain (in-fostered) or by a dam of the other (cross-fostered). This manipulation yielded four groups: F344 pups reared by F344 dams (F/F, n=23), F344 pups reared by LEW dams (F/L, n=25), LEW pups reared by LEW dams (L/L, n=24), and LEW pups reared by F344 dams (L/F, n=24). At approximately 180 days of age, all rats were given 20-min access to a 0.1% saccharin solution followed by a subcutaneous (SC) injection of 32 mg/kg of cocaine. Water was available during the 20-min sessions for the following three days. Fluid consumption was recorded over four conditioning trials and on a final saccharin aversion test. Females in Group L/L significantly decreased saccharin consumption over trials and to a degree greater than that of females in Group F/F (an effect consistent with previously reported differences between the two strains). Cross-fostering significantly affected the acquisition of aversions in Group F/L in that they resembled Group L/L in their acquisition. Group L/F was unaffected by the cross-fostering manipulation. There was no difference between males in Groups L/L and F/F, and cross-fostering had no effect. These results replicate previously reported strain differences in the acquisition of cocaine-induced taste aversions in females and demonstrate that these differences can be affected by the maternal environment. The results further indicate that sex is a factor in the aversive effects of cocaine in the F344 and LEW rat strains. This research was supported in part by a grant from the Mellon Foundation to ALR.

### **Gender and ethnic differences across drug-abuse and sexual-risk behaviors among African American and Hispanic adolescents referred for drug abuse treatment**

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Objective: To assess the extent alcohol use, marijuana use and cocaine use associate with sexual risk behaviors and sexual risk knowledge/intentions while accounting for potential differences attributed to age, gender and ethnicity. Higher rates of (a) alcohol, (b) marijuana, and (c) cocaine use were hypothesized to associate with sexual risk behaviors (hypothesis 1). Higher rates of (a) alcohol, (b) marijuana, and (c) cocaine use were hypothesized to associate with sexual risk knowledge/intentions (hypothesis 2). Gender and age were expected to moderate the associations found in H1 and H2. Methods: 190 youths enrolled in family based treatment for drug abuse/dependence were analyzed. Participants were Hispanic (n = 113) or African-American (n=77), and the majority of adolescents were male (163 boys and 27 girls). The mean age for adolescents was 15.57 (SD = 1.15). Drug use was measured with the Timeline Follow back and Adolescent Drug Abuse Diagnosis scales. Sexual risk behaviors were measured with a latent variable



consisting of engagement in sexual acts, condom use, and extreme risk behavior. Sexual risk knowledge/intentions was measured using a single scale. Structural equation model analysis investigated the hypothesized relations. Results: An acceptably fitting (Comparative Fit Index=0.95; Root Mean Square Error of Approximation=.07) structural equation model was found. Males indicated more engagement in more sexual risk behaviors than females ( $B=.15, p<.05$ ). Alcohol and cocaine use associated with sexual risk behaviors ( $B=.16, p<.05$  and  $B=.18, p<.05$ ). Conclusions: Differences between drug abusing/dependent racial and ethnic minority males and females in HIV risk; specifically, engagement in unsafe sex acts were indicated. Efforts to address these differences and identify alcohol and cocaine problems among racially and ethnically diverse youth could maximize the probability for gender and culturally sensitive HIV risk behavior assessment and interventions.

### **Gender differences in the effects of stimulants on sexual experiences**

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While a considerable amount is known about the sexual experiences of methamphetamine (MA)-using men who have sex with men, little is known about the experiences of heterosexual individuals using MA and/or other stimulants such as cocaine. Participants ( $N=464$ ) enrolled in outpatient substance abuse treatment completed a 25-item self-report survey that inquired about the specific sexual thoughts, feelings, and behaviors of the participant while under the influence of their primary drug of choice. While the overall results have been published previously, this analysis specifically focuses on the stimulant users. The goal is to determine whether MA and cocaine have different effects on sexual experiences and if those effects differ by gender. Analysis with chi-square tests indicated that the cocaine users ( $n = 56$ ) reported negative effects on sexual drive, performance, and pleasure when using. Conversely, the MA users ( $n = 52$ ) indicated a positive relationship between sex and drug use in these domains. Comparing drug group by gender by question, a patterned response emerged. Female cocaine users significantly differed from the other three groups on 11 items ( $p<0.05$ ). They were the least likely of the groups to endorse the association overall and advocated the negative effects of drugs on sexual experiences. Conversely, female MA users differed on 5 questions ( $p<0.05$ ), being the group least likely to endorse negative associations between sex and drug use. In this respect, like males, female MA users demonstrate an intensely positive sex-drug connection, and on some domains a stronger connection than males. Because MA and cocaine have similar psychoactive profiles, their effects on sexual experiences would presumably be comparable. However, our findings indicate that these two stimulants affect individuals' sexual experiences differently. Moreover, they affect men and women differently. Developing valid assessments of the relationship between specific drugs and sexual experiences is critical; these assessments may be essential in relapse prevention protocols.

### **Reduced salivary cortisol after overnight tobacco deprivation**

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Intensive cigarette smoking elevates cortisol levels; however, changes in plasma cortisol during tobacco deprivation have not been adequately characterized. Some studies of tobacco deprivation have shown cortisol to increase during tobacco deprivation, while others have found cortisol to decrease. In the present protocol, salivary cortisol responses in non-deprived (usual smoking) and tobacco deprived (12-hr) conditions were examined. Adult smokers (77: 17 male, 60 female) participated in 2 randomly assigned 2-hr experimental sessions (deprived and non-deprived). Salivary cortisol was collected at 3 different time points during each experimental session (1 p.m. – 5 p.m.): upon arrival (Time 1), after cognitive performance tests (i.e. RIPT) (T2), and end of session (T3). Cortisol concentrations at T1, T2 and T3 were 5.32, 4.61 and 4.39 nmol/L in the deprived condition, and 7.14, 5.46 and 5.10 nmol/L in the non-deprived condition. Cortisol was significantly ( $p < 0.009$ ) reduced after 12-hr tobacco deprivation and over time ( $p < 0.0001$ ). There were no significant gender differences. This gradual decrease in salivary cortisol during the experimental session may be attributed to the ordinary circadian cortisol fluctuations. There were significant decrements in performance during tobacco deprivation. The administration of the cognitive tasks did not increase cortisol levels ( $T2 < T1$ ) in both deprived and non-deprived conditions. Furthermore, there was no significant correlation between cortisol and self-reported craving ( $r = 0.18, ns$ ) and withdrawal scores ( $r = -0.067, ns$ ). These results support findings that cortisol decreases with overnight tobacco

deprivation, and contribute to the notion that cigarette smokers, even when tobacco deprived, have diminished adrenocortical responses to stress.

### **Childhood and adolescent antecedents of drug use in adulthood**

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In this study we follow a community cohort of inner city children into adulthood at age 42 in order to better understand how early characteristics contribute to drug use over the life course. In previous work with this population, we found that aggressive and shy-aggressive behavior in first grade, readiness for school at an early age, and adolescent social bonds predicted drug use in adolescence. At age 32, we found early shy-aggressive behavior continued to increase the risk for males, and early shy behavior was protective for females. We now extend these inquiries ten years later into adulthood at age 42. Children (N=1242) and families in the 57 first grade classrooms from Woodlawn, an inner city community in Chicago, have been followed over the life course. At age 42, 833 participants were re-interviewed (375 males and 458 females). We examined early predictors of cocaine use and marijuana use at this stage of life. We found 13.5% males (n=50) and 9.4% females (n=43) were currently using marijuana, and 6.5% males (n=24) and 3.3% females (n=15) were currently using cocaine. For males, no early childhood behaviors were related to marijuana use, but adolescent marijuana use increased the risk of later use. Males who were shy in first grade were less likely to use cocaine at age 42. For females, being aggressive in first grade increased the risk of using both marijuana and cocaine at age 42. In addition, females who had strong school bonds and parental supervision were less likely to use either marijuana or cocaine. These findings indicate that drug use at age 42 has roots in childhood behavior, and that parental supervision during adolescence continues to influence drug use 25 years later at age 42.

### **Acculturation, smoking, and nicotine dependence among African American women**

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Data suggest acculturation may operate as a risk factor for tobacco use in some populations and as a protective factor in others. The goals of the study were to examine the influence of acculturation on smoking status among 190 African American women, and to examine the role of acculturation on multiple outcome measures of nicotine dependence: # of cigarettes smoked per day (CPD); time to first cigarette (TTF); carbon monoxide (CO); and cotinine (COT). Acculturation was assessed by the African American Acculturation Scale-Revised (AAAS-R) total score and subscale scores. High scores on the AAAS-R reflect a traditional African American cultural orientation. 52% were smokers; mean age was 38 years; 93% had an income of \$49,999 or less; 24% had at least a college degree; and 66% were at least 3rd generation African Americans. Of the smokers, average CO was 11.7 ppm; average COT was 68.26 ng/ml; 80% smoked menthol cigarettes; TTF was within 20 minutes of awakening for 55% of the women; and 61% of the sample smoked 10 or less CPD. Analyses revealed higher scores on the cultural superstitions subscale were significantly associated with current smoking status ( $df=178$ ,  $t=2.40$ ,  $p<.02$ ) and CPD ( $DF[3,79]$ ,  $F=3.31$ ,  $p<.05$ ) among smokers. In addition, higher scores on the preference for things African American subscale were associated with CPD ( $DF[3,79]$ ,  $F=2.75$ ,  $p<.02$ ) among smokers. Furthermore, higher total scores were significantly associated with TTF ( $DF[3,80]$ ,  $F=2.78$ ,  $p<.05$ ) among smokers. The data suggest African American smokers who engage in culturally-based norms and superstitions may believe themselves invulnerable to the deleterious effects of smoking. The findings will be discussed in terms of how some traditional practices of African Americans may impact their risk for smoking and nicotine dependence. An important implication of the study is that intervention programs may need to be tailored to African Americans with a traditional cultural orientation – the likely smokers.

### **Prenatal cocaine exposure alters the monoamine system in a gender-specific manner:**

**Dopamine D1 receptors**

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Prenatal cocaine exposure has been shown to produce increased sensitivity to the attention disrupting effects of SKF81297, a selective agonist of dopamine D1 receptors (Bayer et al., 2000). This data suggests possible long-lasting changes in D1 receptors. The current studies were designed to test for altered content of D1 receptors. Female Sprague-Dawley rats were surgically implanted with an intravenous access port (Mactutus et al., 1994) and allowed one week to recuperate before being paired with male rats for breeding. Upon detection of sperm with vaginal lavage, females were considered to be at gestational day 0 (GD0). Beginning on GD8, animals received saline or 3.0 mg/kg IV cocaine either 1/day or 2/day until GD21, delivered as a bolus injection. Following delivery, male and female pups were allowed to grow to adulthood and brains were removed and frozen for autoradiographic receptor binding studies. 3H SCH23390 was used to quantify levels of dopamine D1 receptors in the prelimbic region, cg1 and cg2. In the prelimbic region, there was a gender by cocaine interaction,  $F(2, 458) = 7.25, p < .001$ . Most notably, D1 receptor levels for male rats in the 1/day cocaine group were significantly higher than for males in the saline control group, while the opposite was true for female rats. That is, D1 receptor levels for female rats in the 1/day cocaine group were significantly lower than for females in the saline control group. Results showed no effects of gender or cocaine in cg1. In cg2, there was a gender by cocaine interaction,  $F(2, 458) = 3.468, p < .05$ . D1 receptor levels for male rats in the 1/day cocaine group were unaffected relative to the male saline control group, while D1 receptor levels for female rats in the 1/day cocaine group were significantly lower than for females in the saline control group. These interactions emphasize the differential effects of prenatal cocaine exposure across gender, particularly with a receptor associated with attention deficits (Bayer, 2000). Supported by NIDA DA009160, DA013965, DA013137, DA013712, and DA014401.

### **Borderline personality and substance use in women**

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Objective: Research on the relation between personality disorders (PDs) and substance use disorder (SUD) has primarily focused on antisocial PD (ASPD) in predominantly male samples. However, in women with SUD, borderline PD (BPD) is among the most frequent co-occurring Axis-II conditions. We focus on BPD because (1) core BPD traits (e.g., affective lability, impulsivity) are known to predispose to and covary with SUD, (2) BPD and SUD have common familial precursors (e.g., family history of SUD, child abuse), and (3) BPD appears to have a localizable neurobiological diathesis, most saliently evidenced as prefrontal cortex dysfunction which is also implicated in the etiology of SUD. Hypotheses: We tested two hypotheses: (1) there is a significant association between BPD and SUD beyond the effects contributed by other PDs and (2) ASPD is a partial mediator of the relation between BPD and SUD. Procedures: The sample included 232 women who participated in projects on the assessment of PDs; the majority (83.6%) were psychiatric patients. DSM Axis-I and II diagnoses were established using best-estimate procedures. Results: Hypothesis (1) was tested by calculating odds ratios for the relation between (1) each individual PD and SUD, (2) BPD and SUD controlling for ASPD, (3) BPD and SUD controlling for all other cluster B PDs, and (4) BPD and SUD controlling for other cluster B PDs and cluster C PDs. Both BPD and ASPD were consistently associated with SUD. Histrionic PD also revealed significant relations with SUD, but these associations were weaker and less consistent. Tests for the mediating effects of ASPD yielded significant results. Because BPD continued to be associated with SUD even when accounting for the effects of ASPD, these findings support the role of ASPD as a partial mediator in the relation between BPD and SUD. Conclusion: Our findings emphasize the need to take into account the role of BPD in examining the relation between PDs and SUD. This is true particularly because women with SUD are at risk for a variety of adverse outcomes (e.g., suicide, domestic violence); these outcomes are further amplified in the presence of BPD.

### **Gender differences in responses to stress and drug-cues in cocaine-dependent individuals**

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Research has shown that stress and drug-cue induced craving and related arousal may increase the risk of relapse in cocaine abusers. This study examined gender differences in these psychobiological responses.

Forty eight recently abstinent treatment-seeking cocaine abusers (24M / 24F) were matched for race, educational status, age and history of cocaine use. All were exposed to three imagery conditions: stress, drug-related cues and neutral/relaxing imagery. Imagery sessions were presented on consecutive days in a random order. Subjective measures (craving and anxiety), cardiovascular measures (heart rate, SBP and DBP) and biochemical markers (ACTH, cortisol, prolactin, EPI and NE) were assessed at baseline and following imagery presentation. Significant main effects of condition were seen for every dependent measure. Baseline gender differences were observed in cortisol, ACTH, prolactin, heart rate and SBP, although similar increases to stress and drug-cues were found in each of these for both men and women. Gender interactions with condition were found only for NE ( $p < 0.0001$ ) and subjective anxiety ( $p = 0.01$ ). Extended analysis indicated that females showed increased NE levels in the drug-cue compared with neutral condition ( $p = 0.001$ ) and increased reported anxiety in the stress compared with drug-cue condition ( $p = 0.001$ ). These differences were not seen in males. Findings indicate that anxiety-related responding in females is specific to the type of cue while in males anxiety-related responding appears non-specific. The findings show gender-specific cue-related responses and support the need for development of gender-specific interventions in cocaine addiction. (Supported by RO1-DA11077, P50-DA16556 to Yale University and P60-DA05130 to Rockefeller University).

### **Men, women, money and beauty: gender differences in the brain-processing of rewarding stimuli**

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A growing body of evidence implicates gender in the course of drug abuse and dependence. However, the relation between reward function and gender is a relatively unexplored domain of the addiction literature. To begin addressing this issue, we examined the effects of two distinct categories of reward (that were previously demonstrated to reliably activate reward centers in humans), one social and the other monetary, on local hemodynamic responses, using BOLD functional magnetic resonance imaging in 14 healthy heterosexual volunteers (7 females and 7 males matched by demographic and educational characteristics). The social reward was viewing attractive vs. average male and female faces. The monetary reward involved financial incentives incorporated in a gambling-like task, which allowed assessment of signal changes that either anticipate or accompany monetary gains and losses under varying conditions of controlled expectation. All images were acquired on a 3 Tesla Siemens Trio MR imaging system; event-related curves were reconstructed and analyzed using a General Linear Model in BrainVoyager. Anatomical images were acquired using a novel acquisition method ("match-warped" images) developed at McLean Brain Imaging Center to provide accurate alignment between functional and anatomic images in the presence of large magnetic field inhomogeneities. Relative to males, female subjects (studied during mid follicular of their menstrual cycle) had significantly higher bilateral cingulate and lower medial prefrontal cortex activations in response to beautiful male faces in comparison to their male counterparts responding to beautiful female faces. Moreover, females had significantly greater bilateral cingulate, insular and medial prefrontal cortex changes during expectancy and receipt of monetary reward. These data suggest that gender can modulate various aspects of reward function. Further studies are needed to confirm these observed gender differences and to investigate their role in more severe and rapid course of addictive processes in women. Supported by DA17959 (IE), DA00343 (SEL), and DA14013 (BBF).

### **Offender substance abuse treatment for women: An evaluation of gender differences**

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The number of women being incarcerated has increased at a faster rate than men during the last decade (Harrison & Beck, 2004). Women now account for approximately 10% of the total prison population. According to one report, 60% of women in state prison report using drugs in the month prior to their offense (Greenfeld & Snell, 1999), suggesting a need for prison-based drug treatment services. Previous research has examined gender differences at intake to prison-based treatment in an effort to identify the unique needs of women and provide support for modifying current prison-based programs to meet these needs. The current study expands upon previous research by using the Texas Christian University (TCU) Criminal Justice – Client Evaluation of Self and Treatment (CJ-CEST) survey to examine differences

between a sample of 457 male and 210 female prisoners (total N=667) admitted to six 9-month prison-based drug treatment programs. The initial set of analyses examined CJ-CEST score differences in several domains identified by the TCU Treatment Process Model (Simpson, 2004) as being important treatment process indicators. Confirming findings of previous research, results revealed higher ratings of problem severity by women than by men. Despite the higher ratings of problem severity, women in general reported higher levels of treatment motivation, engagement, and program satisfaction, as well as lower levels of criminal thinking. Additional analyses revealed a significant interaction between gender and depression level (high vs. low) with criminal thinking. Findings suggest that targeted interventions for women in corrections-based treatment programs may be essential to address their unique psychosocial problems and criminal thinking errors.

**Buprenorphine and methadone in pregnancy: Effects on the mother, fetus and neonate**  
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The aim of the current prospective study is to assess the efficacy and safety of buprenorphine maintenance (BM) regarding pregnancy progression and the incidence and severity of Neonatal Abstinence Syndrome (NAS) compared to methadone maintenance (MM) and non-opioid exposed control pregnancies. It is hypothesised that BM will be as efficacious as MM during pregnancy and in addition the incidence and severity of NAS will follow in the order: control < buprenorphine < methadone. This trial is a non-randomised, open label, flexible dosing study. Data will be presented on 25 sets of women and their infants in each of the three groups of BM, MM and control pregnancies. Drug efficacy during pregnancy will be compared between BM and MM. The occurrence of adverse events throughout the antenatal period, labour and delivery and the first 4 weeks of the postnatal period will be compared between BM, MM and control pregnancies for the mother, fetus and newborn. The severity of NAS and the requirement for pharmacological treatment to control NAS will also be compared between all 3 groups of infants, as some symptoms are non-specific to NAS. Preliminary results from a sample size of 20-24 pregnancies in each group show that there is no difference in the use of additional substances between mothers on either BM and MM programs. There were more adverse events for BM and MM pregnancies than control pregnancies throughout the antenatal period, labour and delivery and the first 4 weeks of the postnatal period. Preliminary results show that buprenorphine produces NAS of intermediate severity between methadone exposed and control infants and that more total morphine is needed to control NAS in methadone exposed infants than buprenorphine exposed infants over the 4 week postnatal follow up period.

**Understanding gender differences in drug use by considering drug-exposure opportunities**

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This poster presents the findings from an investigation of gender differences in the first opportunity to use marijuana and how differences in opportunity account for gender differences in marijuana use among 605 urban youth interviewed annually for five years. Epidemiological data highlight gender differences in both rates of use and abuse with men in all age groups more likely to use illicit substance and more likely to develop drug disorders than women. Gender differences in prevalence data can potentially be explained by research showing that males and females may have differential drug exposure opportunities. This study analyzes longitudinal data collected in grades 6 through 10 with a cohort of individuals who originally participated in a school-based, universal preventive intervention in first and second grades in Baltimore, MD. Our findings show that males were significantly more likely than females to have been offered marijuana by the end of 10th grade (76% versus 65%,  $p < .01$ ). The mean age of first being offered marijuana was 12 for both males and females. Of those offered marijuana, males and females were equally likely to have used marijuana (33%). Once offered marijuana, there were also no differences in the timing of first use; 46% of males and 45% of females used marijuana within the same year that they had been offered marijuana. An additional 26% of males and 25% of females used marijuana within one additional year after being offered marijuana. Thus, the vast majority of males and females who reported any use of marijuana began their use soon after being offered the substance. Racial and socioeconomic differences in

marijuana opportunities and transition to use are also presented. Findings suggest that preventive programs should consider addressing exposure opportunity as one of the earliest stage of drug involvement and focus on assisting youth avoid both opportunities and use once the opportunity is presented.

### **Developmental effects of maternal smoking during pregnancy: Gender differences in cognitive functioning at ages five to six**

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This study examined the association between maternal smoking during pregnancy and early childhood cognitive development in their offspring, in light of gender differences. **SAMPLE AND METHODS:** 172 families were drawn from a community based longitudinal study of child development. Families were matched for gender, maternal education, number of children, income, and ethnicity. Exclusion factors included in utero use of alcohol or drugs, and psychiatric comorbidity. Extensive interviews and observations were made between the ages of 1 and 6 years. In this study, we used the WPPSI-R to assess children's cognitive functioning during the latter part of their kindergarten year. **FINDINGS:** Children in the smoking group performed more poorly than children of controls on measures of visual-spatial coordination including Object Assembly ( $M = 9.97$  vs  $M = 11.11$ ),  $F(1, 171) = 4.74$ ,  $p < .05$ , Geometric Design ( $M = 9.79$  vs  $M = 10.96$ ),  $F(1, 171) = 7.42$ ,  $p < .01$ , Block Design ( $M = 9.60$  vs  $M = 10.45$ ),  $F(1, 171) = 3.57$ ,  $p = .06$ , and Animal Pegs ( $M = 10.69$  vs  $M = 11.52$ )  $F(1, 135) = 3.80$ ,  $p = .05$ . Interactions were also found for smoking and gender on Comprehension, with females in the smoking group performing more poorly ( $M = 10.35$ ) than control females ( $M = 11.76$ ), and males in the smoking group ( $M = 11.39$ ) and control group ( $M = 11.00$ )  $F(3, 168) = 7.42$ ,  $p = .06$ , and on Geometric Design, with females in the smoking group performing more poorly ( $M = 9.10$ ) than female controls ( $M = 11.32$ ), and males in the smoking group ( $M = 10.56$ ) and control group ( $M = 10.56$ ),  $F(3, 168) = 7.42$ ,  $p = .01$ . **IMPLICATIONS:** In this sample, vulnerabilities in children of mothers who smoke during pregnancy appear to fall primarily in visual-spatial skills, which is consistent with previous literature. Specific vulnerabilities were found in daughters of women who smoked. Cognitive functioning scores for all children were in the normal range, however, the lower scores for daughters in the smoking group reveal a concerning developmental vulnerability that may contribute to later difficulties especially in school performance.

### **Neonates of drug dependent mothers in a university hospital in Mexico**

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Drug use among Mexican women has increased according to the National addiction survey. The infants of those mothers are now being detected in neonatal units although there are no published reports in Mexico yet. We describe the incidence and characteristics of infants of drug dependent mothers (IDDM) in a University Hospital in Guadalajara (second largest in Mexico) during a 20 month-period. We studied all the newborns from drug dependent mothers who were admitted to the neonatal intensive care unit (NICU) of the Hospital Civil de Guadalajara from the 1st of January 2003 to October 2004. The main selection criteria was being newborn of a drug dependent mother. **RESULTS** There were 18 cases of IDDM (2%) out of a total of 992 admissions to the NICU during a 20 month period. The mother's mean age was  $24 \pm 3$  years; all were from low educational background. The drug(s) used by the mothers included cocaine 8 cases (44%), cocaine and alcohol 4 (22%), marijuana and tobacco in 3(16%) and inhalants in 3(16%). Two mothers were HIV positive and 2 had positive VDRL antigens. The neonates mean gestational age was  $37 \pm 3$  weeks, mean birth weight  $2696 \pm 429$ g, mean size  $48 \pm 2.6$ cm; apgar score was  $8.3 \pm 1.2$ . Only 6 (38%) cases developed neonatal abstinence syndrome (respiratory insufficiency and psychomotor agitation). The mean length of hospital (NICU) stay was  $6 \pm 7$  days and all received parenteral therapy with phenobarbital. **CONCLUSION.-** Infants of drug dependent mothers are now being admitted to NICU. In our experience these neonates did not show many of the signs and symptoms usually reported in these cases. The drug and type of dependence of the mother may influence fetal maturation and hence the presence or not of immaturity signs and symptoms. Other factors should be investigated.

### **Acute and repeated intravenous cocaine-induced locomotor activity is altered as a function of sex and gonadectomy**

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Recent epidemiological studies suggest that of women who abuse drugs, such as crack cocaine, many become more seriously addicted and spend a longer portion of their lives abusing illegal drugs, relative to men. Studies which elucidate the mechanisms that mediate cocaine-induced sex-differences will be helpful in developing treatments for cocaine abuse by women. The present experiment examined the effects of sex and gonadectomy on cocaine-induced locomotor activity by intravenous (IV) cocaine. Following habituation to the activity chambers, male, female, castrated (CAST), and ovariectomized (OVX) rats received daily IV cocaine injections (3.0 mg/kg/infusion) for 13 consecutive days. Locomotor activity was measured in automated activity chambers for 60 min following the baseline-saline administration and after the 1st and 13th cocaine injections. Observational time sampling was also performed. The automated data revealed that females exhibited more cocaine-induced locomotor activity and rearing compared to males. The sensitized rearing response, which was observed in females, but not males, was attenuated by OVX. This finding suggests sex differences in response to IV cocaine and further shows that OVX attenuated cocaine-induced activity and rearing behavior. The observational time sampling data revealed that females showed higher locomotor composite incidence scores relative to male and OVX rats following acute and repeated IV cocaine injections. CAST, but not male, rats exhibited behavioral sensitization. The orofacial composite incidence data indicates a sex difference in the expression of behavioral sensitization: female rats exhibited higher orofacial composite incidence scores relative to males following 13 IV cocaine injections; however, no sex difference was observed following acute cocaine administration. OVX rats exhibited higher incidence scores than females following the acute cocaine injection only. Collectively, these data show that the locomotor activating effects of acute and repeated IV cocaine were altered as a function of sex and gonadectomy.

### **Improving the transition from residential to outpatient addiction treatment: Gender differences in response to supportive telephone calls**

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This study investigated the effectiveness of supportive telephone calls in increasing attendance at aftercare appointments among substance abusing men and women recently discharged from residential treatment. Participants were 240 individuals enrolled at three sites who were participating in a NIDA Clinical Trials Network study (CTN 0011). Participants were discharged from short-term (7-42 days) residential treatment and randomized to receive a series of seven supportive phone calls (SC) or to treatment as usual (TAU). During the calls, clinicians expressed interest in patient's well being, inquired about substance use and participation in continuing care activities, reinforced positive responses and encouraged increased participation in aftercare programs. Almost all patients (94%) received at least one successful telephone intervention. In comparison to men (n=154), women (n=86) had less severe baseline drug use, fewer alcohol related hospitalizations, lower rates of past incarceration, and more mental health problems (e.g., higher rates of outpatient care, psychiatric medication, depression and anxiety symptoms). Women tended to have higher rates of aftercare appointment attendance than men (52.3% vs. 40.3%,  $p = 0.07$ ). The influence of the phone call regimen tended to be stronger for women than men (23.4% vs. 12.0% absolute increase in attendance over TAU), although this finding did not reach statistical significance. Multivariable logistical regression will be used to assess predictors of aftercare appointment attendance for men and women. The findings from this study will help assess whether there was a differential effectiveness of the intervention on men and women. Ultimately, the findings from this study may help improve treatment efforts for men and women with substance use disorders.

### **Alcohol use among HIV-positive individuals: The impact of gender, personality, and drug dependence**

**C.J. Heckman, K.S. Ingersoll, J. Cohen and A. Walker**

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Alcohol and drug use can contribute to viral infection, treatment non-adherence, and poor clinical outcomes among individuals with HIV disease. The purpose of this study was to determine the impact of specific psychosocial and psychiatric variables on alcohol use among HIV patients. The cross-sectional sample included 90 HIV+ infectious disease clinic patients and was 60% male, 70% African-American, and 60% heterosexual. Measures included demographics, a multidimensional measure of HIV medication adherence, The Alcohol Use Disorders Identification Test (AUDIT), The Composite International Diagnostic Inventory – SF (CIDI-SF) that screened for mental disorders, The Personality Diagnostic Questionnaire (PDQ) that screened for the number of personality disorders present, and the Brief Substance Abuse History Form. Higher AUDIT scores are indicators of hazardous/harmful alcohol use and possible alcohol dependence. Those variables significantly related to AUDIT scores upon univariate analysis were included in the multivariate model, which significantly predicted AUDIT scores ( $p < .001$ , effect size  $\eta^2 = .461$ ). Gender ( $p = .038$ ) contributed independently to the multivariate model with AUDIT scores being higher for men ( $X = 6.77$ ,  $SD = 8.02$ ) than women ( $X = 3.89$ ,  $SD = 7.49$ ), indicating that men were more likely to be experiencing problematic alcohol use or be dependent on alcohol. The other variables that contributed significantly were PDQ score ( $p = .009$ ) and CIDI-SF drug dependence ( $p = .001$ ). Those who screened positive for more personality disorders ( $r = .36$ ,  $p = .01$ ) or who were drug dependent ( $p < .001$ ) were more likely to have high AUDIT scores. HIV+ patients with personality dysfunction are at increased risk of alcohol and drug dependence that can complicate effective healthcare. We will further discuss gender differences in drinking, drug use, personality disorders, and adherence, as well as their combined impact on treatment needs for this challenging population.

### **Voucher-Based incentives for abstinence from cigarette smoking in pregnant and postpartum women**

**S.H. Heil, S.T. Higgins, L. Solomon, I.M. Bernstein, M.E. Lynch, L. McHale, N. Jacuzzi and A. Dumeer**

*University of Vermont, Burlington, VT*

Maternal cigarette smoking is a leading preventable cause of poor pregnancy outcomes in the U.S. Effective interventions exist for promoting smoking cessation during pregnancy, but cessation rates are often low ( $< 20\%$ ). Our group has recently published promising results from a pilot study examining the use of abstinence-contingent vouchers to increase cessation rates during and following pregnancy among women still smoking at their first prenatal care visit. In that study, the majority of women (41/58) were assigned to study conditions as consecutive admissions. In this abstract, we report preliminary results from a replication using a fully randomized design. Sixty-five women have been assigned to a Contingent condition ( $N = 32$ ) wherein voucher delivery is dependent on biochemically-verified smoking abstinence or a Noncontingent condition ( $N = 33$ ) wherein voucher delivery is independent of smoking status. Participants are  $23.8 + 5.4$  yrs old, 92% Caucasian, completed  $11.9 + 2.2$  yrs of education, and smoked  $19.6 + 8.3$  cigs/day prior to learning of the pregnancy and  $9.2 + 5.8$  cigs/day at study admission. There are no significant differences in subject characteristics between treatment conditions. Vouchers are available during pregnancy (\$786 maximum) and for 3 months postpartum (\$360 maximum). Participants are followed through 6 months postpartum. Two contingent and 2 noncontingent participants have had adverse pregnancy outcomes and were excluded from the following results. Verified abstinence rates in the Contingent and Noncontingent conditions at end-of-pregnancy were 10/27 (37%) vs. 2/28 (7%) ( $\chi^2 = 7.2$ ,  $p < .01$ ). At 3- and 6-months postpartum, rates were 4/21 (19%) vs 0/21 (0%) ( $\chi^2 = 4.4$ ,  $p = .11$ ) and 1/19 (5%) vs. 0/17 (0%) ( $\chi^2 = .92$ ,  $p = .99$ ). To our knowledge, these results represent the first replication of the efficacy of contingent vouchers on smoking cessation during pregnancy and the effect appears larger than many other interventions. Results from the postpartum period are still somewhat unclear due to smaller sample sizes, but suggest that there is continued efficacy of contingent vouchers through 3 months postpartum.

### **Spiritual activities and previous spiritual experience as predictors of treatment outcome among patients in an inner city methadone maintenance program**

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*National Institute on Drug Abuse, Intramural Research Program, Baltimore, MD*



Although spirituality is an integral component of some of the most popular approaches to substance-abuse treatment (such as 12-step programs), there is little empirical evidence for a predictive relationship between spirituality and treatment outcome. In the present study, 169 (121 male, 48 female) opiate- or cocaine-abusing treatment seekers completed the Index of Spiritual Experience (INSPIRIT), a tool that assesses spirituality independent of religiosity. Their responses were analyzed in terms of demographic variables and treatment outcome. All patients were offered 12 weekly cognitive-behavioral therapy sessions; opiate-dependent patients also received a 21-day supervised withdrawal with methadone. Outcome was assessed by treatment retention and drug screens from urine collected biweekly under observation. Religious affiliation was 56% Protestant, 24% Catholic, 8% other (e.g. Buddhist, Jewish) and 12% none. Total INSPIRIT score was correlated with number of cocaine-negative urines ( $r = .16$ ,  $p = .038$ ), but not with any other indices of treatment outcome. Time spent on religious activities showed a small correlation with retention ( $r = .165$ ,  $p = .032$ ) and with numbers of cocaine- and heroin-negative urines ( $r = .199$ ,  $p = .01$ ;  $r = .17$ ,  $p = .027$ ). Although there was no sex difference in total INSPIRIT score, women were more likely than men to report spiritual beliefs or experiences on several individual items. African Americans had higher Total INSPIRIT scores ( $F(1,167) = 7.29$ ;  $p < .01$ ) than non-African Americans and were more likely to report spiritual experiences. In general, religious/spiritual beliefs were common in this sample of substance abusers and were associated with treatment outcome, but differed by gender and race. The results of this study support previous reports that spiritually plays a role in substance-abuse recovery and suggest that demographic characteristics should be considered in the design of spiritually oriented behavioral interventions for the treatment of addictions.

#### **Methadone metabolism by pre-term human placentas**

**T.L. Hieronymus, T.N. Nanovskaya, S.V. Deshmukh, G.D.V. Hankins and M.S. Ahmed**

*University of Texas Medical Branch, Galveston, TX*

Pregnancy is associated with changes in maternal physiology and the placenta assumes vital functions necessary for fetal growth and development. The placenta can also act as a functional barrier protecting the fetus from drugs and xenobiotics. Aromatase also known as cytochrome P450 19 (CYP19) was identified in term placenta as the major enzyme responsible for the metabolism of methadone to 2-ethylidene-1,5-dimethyl-3,3-diphenylpyrrolidine (EDDP). The goal of this investigation was to determine the activity of aromatase in placentas obtained from preterm deliveries. All the preterm placentas utilized were of gestational age <36 weeks and were arbitrary divided into the following groups: 17-20 weeks, 21-24, 25-28, 29-32 and 33-36. In all placentas, the only metabolite of methadone formed in the reaction was identified by HPLC/UV as EDDP. The selective inhibitors of aromatase namely, Aminoglutethimide and 4-hydroxyandrostenedione, confirmed its identity by inhibiting the formation of EDDP by 90 and 80%, respectively. Analysis of the methadone saturation curves for each preparation revealed the apparent mean  $K_m$  and  $V_{max}$  (table). GA (weeks) Mean  $K_m$  ( $\mu M$ ) Mean  $V_{max}$  (pmol/mg. pr. Min)

17-20	486	173
21-24	339 $\pm$ 83	111 $\pm$ 40
25-28	433 $\pm$ 186	257 $\pm$ 43
29-32	410 $\pm$ 109	297 $\pm$ 69
33-36	357 $\pm$ 118	242 $\pm$ 92

The data on the activity of the enzyme in second trimester placentas (<25weeks) was lower than that of the third trimester (26-36 weeks,  $p < 0.01$ ). Therefore, it appears that the activity of aromatase in the metabolism of methadone increases with gestational age. Supported by a grant from NIDA to MSA.

#### **Biochemical verification of smoking status in pregnant and recently postpartum women**

**S.T. Higgins, S.H. Heil, G.J. Badger, J.A. Mongeon, L.J. Solomon, L. McHale and I.M. Bernstein**

*University of Vermont, Burlington, VT*

Cigarette smoking is one of the leading preventable causes of poor pregnancy outcomes. As such, there are research and clinical initiatives underway to eliminate smoking among pregnant and recently postpartum women. Important to those efforts are valid methods to assess smoking status. The study to be presented was conducted to examine several different methods and cutpoints for assessing smoking status in pregnant and recently postpartum women. Self-reported smoking status, urine-cotinine levels determined by gas chromatography (GC) and by enzyme immunoassay testing (EMIT), and breath carbon-monoxide (CO) levels were assessed at 28-weeks antepartum and 12- and 24-weeks postpartum in 131 women enrolled in studies on smoking cessation and relapse prevention. Classifications based on urine-cotinine GC testing

served as the standard in most analyses. Overall agreement between self-reported smoking status and classification based on urine-cotinine GC testing was excellent (> 95%) at several cutpoints (50, 25, & 12.5 ng/ml), but highest at 25 ng/ml. We saw no need for different cutpoints antepartum versus postpartum. Classifications based on EMIT urine-cotinine levels were in nearly perfect (> 98%) agreement with those made by GC when the cutpoint for the former was set at approximately 80 ng/ml (79-87 ng/ml). Classifications based on breath CO were in relatively poor agreement (< 87%) with GC classifications at all cutpoints examined, but best at 4 ppm. Overall, this presentation will provide detailed information on several commonly used methods for classifying smoking in pregnant and recently postpartum women that should be practically useful to researchers and clinicians involved in efforts to eliminate smoking in this population.

### **Gender differences of the stress responsive hormones: Prolactin, ACTH, and cortisol in normal and former cocaine-dependent volunteers**

**H.L. Hofflich, Y. Gurevich, G. Bart, A. Ho and M.J. Kreek**

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Relatively few studies have addressed gender differences in basal prolactin, ACTH, and cortisol levels in cocaine and former cocaine dependent subjects. Many studies have addressed gender differences in prolactin in normal volunteers. Also, studies have shown that prolactin release is greater in healthy females than healthy males, in part due to the effect of estrogen on prolactin expression. One small study has suggested increased plasma ACTH secretion in healthy males compared with healthy females, but it also showed a decreased ACTH to cortisol ratio in men. We examined placebo data from ongoing studies of human neuroendocrine function for gender differences in 22 healthy female and 23 healthy male volunteers with no current or past drug addiction, and 7 female and 7 male volunteers with former cocaine dependence (abstinent>6 months). None of the females were on oral contraceptives, nor were they pregnant. Serum prolactin, ACTH, and cortisol concentrations were determined by radioimmunoassay performed on blood samples drawn over 90 minutes following an I.V. saline placebo infusion. A 2-way ANOVA of the area under the curve shows that there was a significant effect of drug history and of gender on prolactin levels. As anticipated, female normal volunteers were found to have higher levels of prolactin than male normal volunteers ( $p<.001$ ). Interestingly, this gender difference was not found in former cocaine dependent males and females. Former cocaine dependent subjects had a lower prolactin level overall ( $p<.01$ ). Females, both drug free and normal volunteers, had a higher prolactin level overall ( $p<.05$ ). There were different, but significant, patterns of gender and drug history effects in ACTH and cortisol. Elucidating gender differences in baseline neuroendocrine function is important to a better understanding of the role of prolactin, ACTH, and cortisol in the stress responsive HPA axis. Supported by grants NIH DA-P60-05130, DA00049; NIH-NCRR-MO1-RR00102

### **Neuropsychological impairment of drug abusers: Commentary**

**A.M. Horton, Jr.**

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While there is considerable agreement that drug abuse can cause brain damage, there has been less attention devoted to the extent of neuropsychological impairment of drug abusers or if there are differential effects of different drugs. This poster will use data on the Trail Making Test (TMT), a commonly used neuropsychological test, to examine the extent and differential effects in a sample of 5619 males and 2902 females. The sample was drawn from electronic files of data from the Drug Abuse Treatment Outcome Study (DATOS), which collected data from 1991-1993. The extent of neuropsychological impairment is examined using previously established cutoffs for brain damage and applying these to different categories of drug abusers. The study has important policy implications for national drug abuse treatment strategies.

### **Female-sensitive drug treatment: Evidence of enhancements in a women-only versus a mixed-gender therapeutic community**

**M.P. Huey, J.A. Johnson and P.M. Roman**

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Evidence of the effectiveness of women-only versus mixed gender treatment programs for substance abusers has been consistently reported in the quantitative research literature. Notably, substance-abusing women have special needs that impact on treatment entry, treatment retention, and successful treatment outcomes. Based on a participant observation in a therapeutic community with both a women-only and a mixed gender program, the purpose of this paper is to highlight and expound upon the differences between these programs and how each program does or does not meet resident needs (both male and female). Specifically the paper focuses on the addition of “female sensitive enhancements” including child live-in options and specialized therapeutic milieus, and the use of confrontational therapeutic styles. Results of the observations reveal that the women-only program incorporates a number of “female-sensitive enhancements” that are not available in the mixed gender program, and the therapeutic styles in each program vary in the level of confrontation with the mixed gender program being much more confrontational. On the one hand, the women-only program shows promise for the treatment of substance-abusing mothers by accounting for their special needs. However, it is evident that women and men in the mixed gender program do not benefit from these same services, and in some instances must deal with undesirable situations as a consequence.

### **Types of child maltreatment that affect stress-coping in cocaine-dependent men and women**

**S.M. Hyman, M. Garcia and R. Sinha**

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The study examined the affects of different types of child maltreatment (sexual abuse, physical abuse, emotional abuse, physical neglect, & emotional neglect) on perceived stress and stress-coping in cocaine dependent adults. Forty-eight men and 40 women at an inpatient substance abuse treatment facility were administered the Childhood Trauma Questionnaire Short Form (CTQ-SF), the Perceived Stress Scale (PSS), and the COPE Questionnaire. Correlation analyses were conducted with the full sample and separately by gender. Findings indicated that, for the full sample, severity of physical abuse ( $p = .008$ ), emotional abuse ( $p = .006$ ), and overall maltreatment ( $p = .027$ ) was associated with an increased use of avoidance coping strategies comprised of alcohol/drug use, behavioral disengagement, mental disengagement, denial, and focus on venting of emotions. Severity of emotional neglect was associated with a decreased use of active coping comprised of acceptance, planning, positive reinterpretation and growth, restraint, and suppression of competing activities ( $p = .021$ ) and also with a decreased use of social support coping comprised of seeking emotional, instrumental, and religious support ( $p = .017$ ). In men, severity of emotional abuse ( $p = .007$ ) and overall maltreatment ( $p = .018$ ) was associated with an increased use of avoidance coping, and interestingly, severity of physical abuse ( $p = .029$ ) was associated with an increased use of active coping. In women, there was only a trend toward emotional neglect being associated with less use of social support coping ( $p = .058$ ). Severity of physical abuse ( $p = .05$ ), emotional abuse ( $p = .01$ ), emotional neglect ( $p = .004$ ), and overall maltreatment ( $p = .003$ ) were related to greater perceived stress in the full sample. There was no relationship between coping and perceived stress. Overall, the findings suggest that child maltreatment affects perceived stress and stress-coping in cocaine dependent adults, with the pattern of associations varying by gender. Child maltreatment appears to have a significant effect on coping tendencies, which may have implications for the behavioral treatment of addiction.

### **Maternal substance abuse, childhood and current victimization among battered women in New York City**

**T. Jospitre, R.E. Sage, S. Griffing, M. Chu, L. Madry and B.J. Primm**

*Urban Resource Institute, New York, NY*

This study investigated the relationship between parental substance abuse and current, as well as childhood victimization among female residents ( $N=277$ ) of two inner-city domestic violence shelters. The mean age of survivors was 26.84 years ( $SD = 6.56$ ), and they were predominately Black (62.5%) and Latina (32.2%). As predicted, independent sample t-tests revealed that survivors with substance abusing parents ( $n=56$ ) experienced higher levels of childhood emotional abuse and neglect, as well as childhood physical abuse and neglect when compared to survivors with non-substance abusing parents ( $n=221$ ). Interestingly, only maternal substance abuse was associated with survivors' (1) childhood history of sexual abuse and (2)

current emotional and physical abuse by an intimate partner. Furthermore, results revealed that more than half of all substance abusing mothers (52%) had been victims of intimate partner violence, to which participants had been exposed during childhood. Limitations and clinical implications of these findings are discussed.

### **Predictors of therapeutic response to contingent fee rebates during outpatient treatment of opioid dependence**

**J.B. Kamien, L. Amass, T.S. Samiy, A.J. Cohen and C. Reiber**

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Identifying patient characteristics that predict a positive response to behavioral interventions involving motivational incentives (i.e., contingency management; CM) may be useful to community treatment providers considering offering CM to their patients. Decreased drug use during earlier stages of treatment often predicts future success in maintaining drug abstinence during exposure to CM. One reason that early performance may predict later success is that performing a behavior targeted for reinforcement demonstrates that a patient has learned how to perform that behavior. Further, contact with new contingencies allows reinforcement delivery to influence the probability of future behavior. This study investigated whether certain patient characteristics predict future drug abstinence during exposure to CM of 108 adult outpatients receiving methadone maintenance therapy. Participants were enrolled in two randomized, 3-arm, parallel groups controlled trials of contingent fee rebates for reducing polysubstance use (Amass et al., this meeting). Fee rebates contingent on weekly random urine samples negative for illicit drugs were provided for 12 weeks. Data were analyzed for 93 participants for whom the 12 week active phase has elapsed. Multiple regression models, controlled for methadone maintenance dose, were used to predict overall study performance from various baseline, demographic, and early performance variables including baseline self-reported days of heroin use in the past month and the urine sample result during the first study week. The baseline days of heroin use in the past month significantly predicted the number of drug-negative urine samples submitted during the trial. Moreover, participants who provided a drug-negative sample during the first study week submitted almost three times more negative samples than those who did not ( $p < .001$ ). Variables that did not predict future abstinence included years of lifetime heroin use, age, gender, ethnicity and baseline medical, employment, alcohol, legal, family/social and psychiatric Addiction Severity Index composite scores. Self-reported and objective indices of drug use predicted future response to this CM procedure and suggests that CM treatment approaches may need to be customized to individual levels of prior drug abstinence.

### **Prevalence and correlates of withdrawal in adolescents presenting for substance-abuse treatment**

**J.L. Kamon, A.J. Budney, M.L. Dennis and R.R. Funk**

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The current study assessed the prevalence and severity of withdrawal symptoms among adolescent presenting for outpatient substance abuse treatment. Participants were 5432 adolescents across 62 substance abuse treatment research sites. Upon intake into treatment, adolescents provided retrospective reports of withdrawal symptoms that occurred during prior periods of abstinence. Withdrawal symptoms, as well as other substance use information were assessed using the Global Appraisal of Individual Needs (GAIN) interview. An exploratory cluster analysis was performed to examine withdrawal patterns. Results suggested a 4-group solution which explained 97% of the variance in scores on the Current Withdrawal Scale of the GAIN. The 4-group solution included the following groups: No Withdrawal ( $n=3928$ ), Low Withdrawal ( $n=735$ ), Moderate Withdrawal ( $n=500$ ), and High Withdrawal ( $n=269$ ). In addition to describing the withdrawal symptom profile, we performed chi-square analyses to examine potential predictors of withdrawal group including demographic characteristics such as age, gender, and race, as well as substance use severity, and psychological problems. Results indicated that older, female, and Hispanic adolescents were significantly more likely to report higher levels of withdrawal. In addition, adolescents were significantly more likely to report higher levels of withdrawal if they: a) reported early initiation and more years of substance use; b) met diagnostic criteria for dependence; d) reported experiencing acute withdrawal symptoms in the week prior to entry into treatment; e) and met diagnostic criteria for an

Internalizing or Externalizing psychological disorder. Regression analyses will be presented to examine drug type as a predictor of withdrawal. These findings demonstrate that adolescents presenting for substance use treatment across many different treatment centers report experiencing withdrawal symptoms. Implications for treatment will be discussed. This work is supported by CSAT contract 270-2003-00006, NIDA DA12471 and T32-DA07242-14.

### **Cognitive failure in cannabis and club drug users in comparison to non-users in a population-based sample**

**U. Kandler, M. Piechatzek, F. Indlekofer, R. Lieb, H.U. Wittchen and C.G. Schuetz**

*Max Planck Institute, Ludwig-Maximilians Universitat, Munich, Technische Universitat, Dresden, and Friedrich-Wilhelms-University, Bonn, Germany*

Title: Cognitive failure in cannabis and club drug users in comparison to non-users Objectives: To assess the effect of illegal drug use on cognitive failure Methods: A subgroup of the EDSP (Early Developmental Stages of Psychopathology)-study was created by including 287 young adults with either a history of cannabis or club drug use and a control group. The EDSP is a longitudinal study of a population sample of 3021 adolescents and young adults at baseline. The participants of the subgroup underwent a battery of cognitive tests, which assessed intelligence, memory and executive functions. In addition they were asked to answer several questionnaires including the cognitive failure questionnaire, which consists of 32 questions about mistakes or mishaps, which occurred to them during the past 6 months. High scores are interpreted as a high rate of cognitive failure. Results: 281 persons answered the cognitive failure questionnaire, 174 were males and 107 females. They scored between 11 and 74 with a mean score of 33.21 (standard deviation 12.78). According to their history of illegal drug use they were distributed into 3 groups, namely controls (130 persons), club drug users (68 persons) and cannabis users (85 persons). Linear regression was performed to assess the association between the cognitive failure score and substance or control group. The resulting coefficient was 1.93 with a p-value of 0.03. When regression was done separately for each sex, the regression coefficient was 3.16 ( $p=0.003$ ) for males compared to a coefficient of 0.29 ( $p=0.854$ ) for females. Discussion: Cognitive failure scores are significantly higher in the substance users than in controls. The effect is much stronger and significant in male participants than in females. Amount of consumption as well as age of onset may be responsible for this difference, which will be explored further.

### **Creating a spiritual community that reinforces drug abstinence: Preliminary report**

**M.L. Kerwin, K. Walker-Smith, R.A. Corbin, T.M. Faranda-Diedrich, J. Menarde and K.C.**

**Kirby**

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Community Reinforcement involves altering the patient's social community such that immediate social reinforcement is provided for abstinence and alcohol or drug use is more likely to be ignored or followed by loss of reinforcement. Thus far, Community Reinforcement has been implemented by therapists who help the client recruit at least one person who will be trained to provide the contingent consequences. Unfortunately, finding social support can be difficult when the client's drug use has led to social isolation. Religious communities are naturally-existing communities of reinforcement that can be recruited and remain in place after treatment, offering sustained reinforcement of drug abstinence. We are developing Community Reinforcement through Religious communities (CRA-R), which recruits stable individuals from religious communities to serve as Community Anchor Persons (CAPs) for drug abusing women in treatment. CAPs are trained to deliver contingent reinforcement for abstinence and to ignore drug use and other undesirable behavior. Patients and their CAPs meet in a weekly group to share enjoyable abstinent social events. These weekly meetings begin and end with spiritual readings. Between weekly meetings, CAPs are encouraged to contact their assigned patient and invite them to religious and other social events. This presentation describes our experiences identifying, recruiting and training CAPs, attendance at weekly CRA-R meetings, and results of weekly random urine testing for five African American drug-abusing women in outpatient treatment. Preliminary results suggest that CAP contact between meetings influences patient attendance at CRA-R meetings. On 31.4% and 17.9% of the occasions when the CAP contacted the

patient, the patient attended and did not attend the meeting, respectively. On 28.6% and 20.7% of the occasions when the CAP did not contact the patient, the patient did not attend and attended the meeting, respectively. As predicted, over a period of 40 weeks, attendance was higher following negative urine results than positive urine results.

### **Sexually transmitted diseases in poor female crack users of Porto Alegre, Brazil**

**F.H. Kessler, F. Pechansky, L. Von Diemen, J. Inciardi, and H. Surratt**

*Federal University of Rio Grande, Porto Alegre, Brazil*

**Introduction:** In Brazil most data in the present literature have shown the increasing incidence of HIV among poor women – with particular emphasis on the influence of drug use in their risk behaviors.

**Objectives:** to ascertain drug use, exposure to risk and violence, depressive symptoms, and prevalence of HIV, HCV and Syphilis among inner city, out of treatment female crack users of Porto Alegre, Brazil's fifth largest city. **Method:** In a cross-sectional design, 76 subjects answered to the Risk Assessment Battery (RAB), an AIDS Information questionnaire, NIDA's RBA and the Mental Health Checklist for depression. Subjects also had their urine tested for cocaine and provided blood for HIV, HCV, and syphilis tests.

**Results:** The mean age was 28.4 (SD=7.8); 49.2% were black, 76.3% had a steady partner and their median income was US\$95. HIV seroprevalence was 35.7%; and HCV and Syphilis rates were 28.4% and 20.3%, respectively. With regard to drug use, the median days in the month prior to interview was 12 for crack, 8 for marijuana, and 8 for alcohol; 34.2% had injected drugs at least once in life. Out of 15 questions, the mean of correct answers to the AIDS information scale was 12.7 (SD=1.3). In the 6 months prior to interview 71.1% of the women reported infrequent condom use, and 38.2% reported no condom use; 43.4% reported sex with two or more men in the last semester, and 71.1% reported depression symptoms. With regard to domestic violence, 64.5% had reported to have been victims of some type of violence caused by their partners during the month prior to interview. **Conclusion:** All rates of seroinfection described in this sample are higher than the general women population, suggesting that the association between heavy drug use and poverty must play a role in this finding. The presence of depressive symptoms may be associated with the specific form of drug use and type of drug described. The interplay between poverty, domestic violence, crack use, and its expression in high rates of sexually-transmitted diseases certainly represents a major public health problem in urban pockets of Brazil. Further studies to confirm this association must be conducted, with particular emphasis on the new crack epidemic that is occurring in the country.

### **Less is more. Encouraging reductions in tobacco use with newly postpartum women**

**L.A. Keyser-Marcus, G.C. Britt, L.D. Meloy, P. Kum-Nji, K. Reid-Quinones and D.S. Svikis**

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Much attention has been focused on smoking cessation during pregnancy. Although the health benefits to both mothers and their unborn children have been well-documented, (Stevens, Becker, Krumpos, Lanz, et al, 1988), elimination of tobacco use appears to be an unattainable goal for many women. Further, women who are able to abstain from using tobacco during pregnancy often return to pre-pregnancy tobacco consumption levels within weeks of delivery. The current study examined changes in tobacco use in mothers of infants attending an urban, university hospital-based pediatric clinic (N=83). While data collection is still ongoing, preliminary analyses were performed. Respondents were primarily African-American (63%), and between 18 and 43 years off age. Of the women classified as smokers (N=23), significant reductions in tobacco use ( $t=3.6$ ,  $p<.01$ ) were reported during the first trimester (mean 15 cigarettes/day pre-pregnancy versus 6 cigarettes/day first trimester). Further, women continued to demonstrate decreased smoking rates during the second and third trimesters, with an average of 4.9 and 4.5 cigarettes/day, respectively. The most commonly cited reason for reduced tobacco use during pregnancy was concern for baby (69%). Postpartum rates of tobacco use, although still significantly lower than those reported prior to pregnancy, increased slightly within the first 16 weeks postpartum to an average 9.7 cigarettes/day (sd= 6.5). Interestingly, women appeared much less concerned about the harmful effects of smoking on children postpartum, as items regarding smoking affecting an earlier newborn and concern for the health of older children were endorsed less frequently (29% and 11%, respectively) than quitting for own health (36%). These findings suggest that although the harmful effects of prenatal smoking are well-understood, the continued health risks to children associated with environmental tobacco smoke may be

overlooked. The implications for health promotion education and harm reduction strategies are discussed. This research was supported by NIDA DA 11476 and NIAAA AA 11802.

### **Effectiveness of motivational incentives for drug abuse recovery in multiple treatment history and treatment-naïve outpatients**

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Purpose: To determine if prize-based abstinence incentives will affect substance abuse outcomes differently in patients with different treatment histories. Design and Population: 415 treatment seeking outpatients with self-reported stimulant use in the past 14 days were randomized to receive either prize-based incentives plus treatment as usual (TAU) or TAU alone. Urine drug screens were conducted twice weekly for 12 weeks. Participants were divided into those with greater (two or more, detox excluded; n=150) or fewer (less than two; n=260) prior treatment episodes. Outcome variables included longest sustained period of abstinence and retention in treatment. Method: Baseline differences between the two treatment history groups were analyzed using Pearson's chi-square analysis and independent t tests. GLM univariate analysis of variance with study group and treatment history entered as fixed independent variables was used to predict the outcome variables. Findings: There were significant between-group baseline demographic, psychosocial and substance use differences. Treatment experienced participants were older, more likely to be female, African American, unemployed, and were more likely to have a stimulant abuse or dependence diagnosis and a history of psychiatric problems. Those with fewer prior treatment episodes were more likely to have legal problems and a longer history of methamphetamine/ amphetamine use. However, there were no treatment outcome differences based on treatment history and no interactions between the incentive intervention and treatment history. Implications: Patients with previous treatment episodes present into treatment with a different and generally more severe range of psychosocial problems but nevertheless respond to abstinence incentives adjunctive to TAU with similar favorable outcomes as those observed in treatment naïve patients. Patients both with and without extensive treatment histories can benefit from abstinence incentive interventions.

### **Child welfare costs at four-year followup for mothers attending women-only versus mixed-gender long-term residential treatment**

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Child welfare service (CWS) involvement is known to be high among substance abusing women. Specialized treatment programs designed specifically for parenting women have been developed to address the additional needs faced by mothers and their children. This study compares the costs related to CWS involvement among 665 chemically dependent women with a young child (<12 years) living with them at some time during the two years prior to admission to long-term residential treatment that was either specialized for women only (SP, N=476) or a standard mixed-gender (ST, N=189) program in Washington State. Data come from several administrative data sources. Patients were predominately single (89%) with a mean age of 30 and education of 11 years. They were 69% Caucasian, 15% African American, and 10% Native American. Of the 665 women in the study, 267 (40%) had a CWS case opened during this same two-year period. Preliminary longitudinal analyses suggest that despite equivalent rates of CWS involvement at admission (40% for each group, 191 SP and 76 ST), SP women had higher rates of new CWS involvement at 1-year followup but ST women had higher rates at 2-, 3-, and 4-years followup. In addition, mean CWS service charges were consistently higher for ST (M=\$9,782/year) than SP (M=\$6,632/year) women, and the gap continued to increase throughout the 4-year followup period. Cost savings (dollar and social) related to reduced CWS involvement may help to defray the higher costs of administering SP (relative to ST) programs. ACKNOWLEDGMENT: Supported by NIDA grant #1 R01 DA15094-01.

## **Risky business: Sexual behaviors in cocaine-dependent individuals**

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High risk sexual behavior is often observed in substance dependent individuals. The purpose of these analyses was to examine high risk sexual behavior in DSM-IV cocaine dependent (n=710) and non-dependent individuals (n=909) as part of the Family Study of Cocaine Dependence. Individuals were recruited in substance abuse treatment centers, through driver's license records, or through a sibling who participated. Participants completed a semi-structured interview, which evaluated substance use and psychiatric disorders. Cocaine dependent subjects reported higher rates than non-cocaine dependent subjects (including those who have never used cocaine) of prostitution (31.0% vs. 3.9%,  $p < .001$ ), trading sex for drugs (34.1% vs. 1.5%,  $p < .001$ ), having sex with ten or more partners in a year (32.0% vs. 9.2%,  $p < .001$ ), and having unprotected sex with someone who may have a sexually transmitted disease (20.5% vs. 8.6%,  $p < .001$ ). Dependent subjects also had more sex partners ( $\mu = 30.7$  vs.  $\mu = 11.9$ ,  $p < .001$ ) and had intercourse at a younger age ( $\mu = 14.8$  vs.  $\mu = 16.3$ ,  $p < .001$ ) than non-dependent subjects. Gender, ethnicity, cocaine, alcohol, marijuana, and other dependence were entered as predictor variables in multiple logistic regression analyses for four high risk sexual behaviors. Cocaine dependence was the strongest predictor for all four behaviors: prostitution (OR=9.77,  $p < .001$ ), trading sex for drugs (OR=30.11,  $p < .001$ ), having ten or more sex partners in a year (OR=1.88,  $p < .001$ ), and having unprotected sex (OR=2.10,  $p < .001$ ). Women and African-American subjects were at greater risk of engaging in prostitution (OR=3.04, OR=5.90 respectively,  $p < .001$ ) and trading sex for drugs (OR=2.28, OR=3.74 respectively,  $p < .001$ ). In addition, men were 1.78 times more likely than women to have ten or more sex partners in a year ( $p < .001$ ). Alcohol, marijuana, and other dependence predicted fewer high risk sexual behaviors and to a lesser degree than cocaine. In summary, cocaine dependence is strongly associated with high risk sexual behavior and these patterns of sexual behaviors appear to be unique for cocaine dependence compared to alcohol and other drug dependence. Supported by NIDA grant DA13423.

## **Establishing a statewide research coalition to address the causes and prevention of youth tobacco use**

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The Virginia Youth Tobacco Project (VYTP) was established in 2002 to advance the scientific study of youth tobacco use through an integrated program of basic and applied research. The VYTP is a program of the Institute for Drug and Alcohol Studies, Virginia Commonwealth University; it is funded by the Virginia Tobacco Settlement Foundation (VTSF), a state agency created to administer the 10% share of Virginia's proceeds from the Master Settlement Agreement that lawmakers have allocated to youth tobacco-use prevention. The VYTP has research projects underway focused on: genetic epidemiology of tobacco initiation and dependence; behavioral pharmacology of nicotine; clinically observed patterns of adolescent smoking behavior; characteristics of tobacco-vulnerable populations; gender- and ethnic-specific risk and protective factors; tobacco prevention media effects; and tobacco control policies. A major component of the VYTP is its Research Coalition; six universities that have been brought together to: 1) build a statewide, coordinated research program; 2) translate research findings into improved prevention efforts; 3) attract new faculty to work on problems of youth smoking; 4) use VTSF sponsorship to leverage additional funding for youth tobacco research in Virginia; and 5) create active multi-university collaborations in carrying out the VYTP research program. The VYTP Research Coalition activities to date have included a small grants program, a research conference, coalition meetings, and targeted funding of multi-university sponsored research projects. In its relatively brief existence, the VYTP has produced more than 30 conference presentations, over 9 articles published or in press, and 6 NIH grant applications. Much of the research conducted since the establishment of the VYTP includes collaborations across two or more universities. Currently, six multi-university collaborative studies are being conducted, and several others are being planned. The presentation will describe the mission, organization, activities, major accomplishments and challenges of the VYTP Research Coalition. Funding for this project was provided by the VTSF.



## **Sex differences in analgesic and subjective responses to morphine in humans**

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Sex differences in the effects of opioid medications have been examined fairly extensively in rodents and non-human primates. Although agonists selective for the  $\mu$  subtype of opioid receptor are generally more potent in male than in female laboratory animals, results of studies in humans are less clear. The present prospective double-blind, placebo-controlled outpatient study compared the effects of morphine in normal, healthy men (N=8) and women (N=10). We hypothesized that the potency of morphine would be greater in men as measured by analgesic and subjective responses. Participants received an intramuscular injection of placebo or morphine (5, 10mg/70kg) on each session day (12 sessions total). Participants completed one of two experimental pain tests once before and twice after drug administration. The cold pressor test consisted of immersion of the forearm in 4°C water. Both threshold (latency to feel pain) and tolerance (latency to withdraw the arm) were recorded (maximum immersion time=180 sec). The mechanical pressure test consisted of the placement of a weight (440, 600, 780, or 955 g) upon the participant's finger. The participant was then asked to rate his or her subjective experience of pain at 5, 10, 20 and 30 seconds, upon which time the weight was removed. The data were analyzed using signal detection theory. Participants also completed a number of subjective effects questionnaires. Morphine produced increases in both objective and subjective measures of analgesia in both men and women (e.g., placebo versus 10 mg/70 kg morphine for cold pressor test threshold:  $P<0.001$  and  $P<0.03$  for women and men, respectively), but no significant differences were found between the sexes. Sex differences were found in subjective responses: men reported significantly more positive drug effects after morphine administration (e.g., the main effect of sex for ratings of "Good Effect" was significant at  $P<0.02$ ). These results further demonstrate the complexities of sex differences in  $\mu$  opioid effects in humans. Supported by DA10909.

## **Pathways between childhood victimization and adult sex trading among substance-using women**

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Childhood victimization (child abuse) has been associated with adult sexual and substance use risk behaviors related to HIV. This paper presents a model developed to understand the link between childhood victimization and sex trading in adulthood. We proposed a unique model that attempts to understand the complex pathways between childhood victimization and perpetration experiences with adult depression, PTSD, cocaine dependence and sex trading. A cohort of heavy drinking and drug using women (n=577) were recruited from the St. Louis community, for participation in one of two community-based HIV prevention projects funded by NIDA and NIAAA. Variables were ascertained through the DIS, Violence Exposure Questionnaire, CIDI-SAM and WU-Risk Behavior Assessment. The outcome variable was sex trading – defined as trading sex of any kind for alcohol/drugs/money/food/shelter/clothes. Respondents were predominantly African American (83%). Sex traders (ST) were more likely than Non-sex traders (NST) to report childhood victimization (47% vs. 36%). Likewise, perpetration of violence during childhood was more common among ST than NST (44% vs. 32%). The path analysis results revealed direct associations between childhood victimization and adult depression, PTSD, cocaine dependence and sex trading. Childhood perpetration of violence was directly associated with PTSD. Both depression and PTSD predicted cocaine dependence. The path between childhood perpetration of violence and cocaine dependence is mediated by PTSD. Childhood victimization and cocaine dependence had a direct strong association with adult sex trading. This study concludes that a history of childhood victimization among women is associated with depression, PTSD, cocaine dependence, and sex trading in adulthood. The detailed path model and the implications of the findings will be discussed. (AA12111 and DA11622, Cottler PI).

## **Chronic estradiol administration mediates the inflammatory response to formalin in OVX female rats**

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Female rats demonstrate higher pain sensitivity than do males in various nociceptive assays of inflammation. Formalin administration is a commonly used model to study inflammatory pain responses. While persistent nociceptive responses to formalin may partly be due to central sensitization, it has been postulated that responses to higher concentrations of formalin may rely to a greater extent on peripheral inflammation. Using these differences in mechanisms regulating formalin responses, the aim of this study is to determine the role of estradiol in peripheral vs. central inflammatory responses in OVX rats. OVX rats received s.c. SILASTIC implants (1 cm, 0.058 in. ID X 0.077 in. OD, Dow Corning) s.c. of either cholesterol (100%), estradiol (20%) or estradiol, an inactive isomer of estradiol (20%). Chronic estradiol replacement attenuated the chronic phase of the formalin response at a high concentration (5%) [ $F(3, 52) = 18.545$ ;  $p < 0.00$ ]. Estradiol failed to affect formalin-induced responses at low concentrations (1%) in either Phase I or II. This in part suggests that chronic estradiol replacement affects pain related responses to peripheral inflammation. -estradiol, failed to result in the same attenuation at high concentrations ( $p > 0.05$ ), suggesting that estrogen effects are receptor mediated. Thus, our results strongly suggest that estrogen effects on peripheral inflammatory responses are genomic in nature. Supported By: RR-03037, NIDA DA 12136, SCORE 506-GM60654, and SNRP NS41073.

### **Three-site study of prescription drug abuse among ecstasy users**

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Hypothesis: MDMA (ecstasy) users will show high rates of polydrug use, including the abuse of prescription drugs. Procedures: 634 males and females ages 16 and older were recruited by targeted and respondent-driven sampling strategies. Interviews included drug and alcohol use and treatment histories, sexual behaviors and mental and physical health data. Analyses: Descriptive statistics were calculated using demographic, health and drug history data. Pearson's chi-square and t-tests were performed to examine bivariate relationships. Results: Median age was 23; 42% were female and 62% white/Anglo. 69% had histories of prescription drug misuse, but these rates varied across sites: Miami, 81%; St. Louis, 73%; Sydney, 46%. Of those, 71% reported abusing tranquilizers/sedatives, 66% opioids, and 39% stimulants. Prescription drug abusers had earlier onset ages for alcohol and street drugs, had used twice as many different types of drugs, and had used ecstasy more than twice as many times, as others. Prescription drug abusers were more likely to report having been arrested, having sought drug/alcohol treatment, having risky drug and/or alcohol use behaviors that need changing, and to have experienced symptoms of depression in the prior 12 months. Such respondents reported withdrawal symptoms from those drugs, including nausea, anxiety and craving; physical health problems, including headaches, dizziness, and memory lapses; and emotional problems including depression, confusion, and aggression. Aside from rates of prescription drug involvement, cross-site patterns were similar except that the Sydney data showed an association between sexual risk behaviors and prescription drug involvement. Importance of findings: Ecstasy users exhibit high levels of polydrug use that include a large and integrated prescription drug component. Health consequences from abuse of prescription drugs are prevalent. Prescription drug abuse appears to be much higher among this population in the U. S. than in Australia, but such abuse is indicative of earlier drug initiation and more extensive drug involvement across all three sites.

### **Evidence for gender differences in cue reactivity to in vivo smoking cues in nicotine dependent smokers**

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It has been proposed that men and women respond differently to stress- and substance-related cues presented in the context of a laboratory-based cue reactivity protocol. Specifically, women are hypothesized to crave more to stressful imagery cues, while men are hypothesized to crave more to in vivo cues. As part of an ongoing study investigating the effects of menstrual cycle on craving, we collected ratings of craving and the amount of control one could gain if allowed to smoke. Ratings of emotional valence (pleasant/unpleasant), arousal, and dominance were also collected. In addition, physiological

measures of reactivity, including heart rate (HR) and skin conductance response (SCR) were collected as well. Participants were healthy nicotine-dependent individuals ( $n=29$ , 13 females). Participants were presented with affective imagery scripts (relaxed vs. stressed) and in vivo cues (neutral vs. smoking) using a counterbalanced order. Each presentation was 90s in duration. In the imagery condition, stressful imagery elicited more craving than relaxing imagery,  $F(1,27) = 9.33$ ,  $p < .01$ . There was a trend ( $p < .06$ ) indicating that, in response to stressful imagery, participants were more likely to report that they would feel more in control if they could smoke. No gender differences were evident in response to imagery cues. For in vivo cues, the hypotheses were confirmed. Both males and females reported greater craving when viewing smoking cues relative to neutral cues,  $F(1,27) = 37.28$ ,  $p < .001$ , and both reported that they would feel more in control if allowed to smoke  $F(1,27) = 4.43$ ,  $p < .05$ . However, males experienced more pronounced craving to smoking cues relative to neutral than did females  $F(1,27) = 8.82$ ,  $p < .01$ . Consistent with this, males tended to show greater SCR than females, particularly in response to in vivo smoking cues relative to neutral ( $p = .052$ ). These preliminary results suggest that gender is an important moderator of craving and reactivity to situations involving in vivo cues.

### **Effects of short- vs. long-term estrogen treatment on cocaine-induced reinstatement in OVX female rats**

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Previous work has shown that cocaine-induced reinstatement responding is greater in female than male rats. In order to test the hypothesis that estrogen mediates the increased responding seen in females, cocaine-induced reinstatement was examined in sham-operated (SH+VEH), ovariectomized (OVX+VEH), and OVX female rats with estrogen (EB) replacement (OVX+EB). Rats were trained to self-administer 0.4 mg/kg/inf cocaine (FR1), and then were maintained on this dose for 14 days. Subsequently, cocaine solutions were replaced with saline, and rats extinguished their lever pressing behavior over the next 21 days. They were then assessed for their reinstatement of lever pressing behavior after priming injections of either saline (S) or 10 mg/kg cocaine (C) over 6 days (SCSCSC). In Experiment 1, OVX+EB rats were treated with EB throughout training, maintenance, extinction, and reinstatement (long-term treatment, ~60 days). In Experiment 2, OVX+EB rats started their EB treatment after extinction to determine if EB could enhance reinstatement responding when given only during the reinstatement phase (short-term treatment, 9 days). There were no differences between groups for self-administration behavior during training, maintenance, or extinction in either Experiment 1 or 2. In Experiment 1, it was found that OVX+VEH rats' reinstatement responding was less than that of SH+VEH or OVX+EB rats. In Experiment 2, short-term OVX+EB rats also had enhanced reinstatement responding compared to OVX+VEH rats, and both groups were comparable to Experiment 1. This suggested that EB was not necessary early in training or maintenance for the formation of stimulus-reward associations, but EB was important for elevated reinstatement seen in female (vs. male and OVX+VEH) rats. This research was supported by NIDA R01 DA03240, K05 DA015267 (MEC), T32 DA07097, and F31 DA14161 (MER).

### **Gender differences in acute tobacco withdrawal**

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The acute tobacco withdrawal syndrome is an important component of tobacco dependence. We investigated whether male ( $n = 99$ ) and female smokers ( $n = 100$ ) differed in abstinence-related changes on self-report measures, cognitive performance tasks, and physiological responses. Smokers not wishing to quit completed two counterbalanced experimental sessions. Before one session, they abstained from smoking for over 12 hours, and before the other they smoked normally. Women reported significantly greater abstinence-related increases in ratings on the total score of the Wisconsin Smoking Withdrawal Scale (WSWS) (significant gender by abstinence state interaction;  $F(1,197) = 10.2$ ,  $p < .01$ ), and on the Anger, Anxiety, concentration, and Sadness WSWS subscales (all  $ps < .05$ ). On the Questionnaire for Smoking Urges (QSU-Brief), women reported significantly Greater abstinence-related increases in ratings on the factor 2 scale ( $p < .01$ ), but not on the factor 1 scale. On the Positive and Negative Affect Schedule, women reported significantly greater abstinence-related increases in Negative Affect,  $F(1,197) = 14.1$ ,  $p <$

.01. Men and women did not differ in the degree of abstinence-related decrements in performance on a rapid visual information processing task (RIPT). Brain electroencephalogram (EEG) data indicated that men and women did not differ in the degree of abstinence-related increases in theta power. In general, women reported greater severity of withdrawal than men on self-report measures. However, there was less evidence for between-gender differences in abstinence-related decrements on objective cognitive tasks, or abstinence-related changes in EEG responses. These findings highlight the need for development of gender-specific interventions for tobacco dependence.

### **Antisocial personality and stress-induced brain activation in cocaine-dependent individuals – potential sex differences**

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Objective: Sociopathic individuals demonstrate less emotional and autonomic arousal in stressful situations. We employ functional brain imaging to explore the neural correlates underlying altered stress processing in sociopathy. Method: Blood oxygen level dependent contrast during script-guided stress imagery was compared between abstinent cocaine dependent individuals who had antisocial personality disorder (ASPD, n=11) and those who did not have ASPD (n=16). Regions of interest analysis examined for correlation with California Psychological Inventory socialization (CPI-so) score across individual subjects. Results: Despite similar increases in heart rate and subjective anxiety rating, ASPD patients had less activation in the posterior cingulate cortex during increased stress, compared to non-ASPD patients. Moreover, activity in medial prefrontal cortex correlated inversely with CPI-so in female subjects. Conclusions: ASPD patients may have difficulty learning from emotional experiences because of affect processing deficit in the posterior cingulate. In addition, increased activity in medial prefrontal cortex may reflect physiological underarousal in female sociopathic individuals. (Supported by NIH grants R01-DA011077, P50-DA16556 and K02-DA017232)

### **Ethnic- and gender-specific association of the nicotinic acetylcholine receptor alpha 4 subunit (CHRNA4) gene with nicotine dependence**

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We tested six single nucleotide polymorphisms (SNPs) in the CHRNA4 gene and three SNPs in the CHRNB2 gene for association with nicotine dependence (ND), which was assessed by smoking quantity (SQ), the Heaviness of Smoking Index (HSI), and the Fagerström Test for ND (FTND) in 2,037 subjects from 597 nuclear families of either European-American (EA) or African-American (AA) origin. Analysis of the six SNPs within CHRNA4 demonstrated that SNPs rs1044397 and rs2273504 are significantly associated with adjusted SQ and FTND scores, respectively, in the EA sample. In the AA samples, SNPs rs3787137 and rs2236196 are significantly associated with at least one adjusted ND measures. Association of SNP rs2236196 with the adjusted HSI and FTND scores in the AA population remains significant after correction for multiple testing. Furthermore, analysis of these SNPs with ND measures revealed gender- and ethnic-specific associations for several SNPs in both ethnic samples; however, only SNPs rs2273504 and rs2236196 remain significant after correcting for multiple testing in the AA females. Haplotype analysis further showed significant association of haplotypes C-G-T (60.6%) with the age- and gender-adjusted SQ and HSI in the EA males and of C-G-C (51.0%) and C-A-T (15.3%) with at least one adjusted ND measures in the AA females. For CHRNB2, we found no associations with ND for either single SNPs or haplotype in either the pooled or the ethnic-specific samples. In summary, our findings provide convincing evidence of the involvement of the nAChR alpha 4 subunit, but no evidence for involvement of the nAChR beta 2 subunit, in nicotine addiction (supported by NIH DA-12844).

### **Sex differences in the molecular consequences of ‘binge’ cocaine self-administration in rats**

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Chronic cocaine treatment produces long-term changes in the dopamine D1-cAMP signaling pathway and these changes are thought to underlie the development of cocaine abuse. Since previous work has also demonstrated sex differences in the progression to cocaine abuse, we examined the possibility that this pathway is differentially activated by cocaine in males and females. Rats were trained to self-administer cocaine (1.5 mg/kg) under a fixed-ratio 1 schedule until acquisition occurred, and then responding was assessed under a progressive schedule (PR) for three sessions. Subsequently, rats had 24-hour access to intravenous cocaine infusions (1.5 mg/kg) that were available in discrete trials (4, 10 min trials/hour) for seven consecutive days. To evaluate whether alterations in the dopamine D1-cAMP signaling pathway were associated with changes in motivation to obtain cocaine following 'binge' cocaine self-administration, protein levels were assessed in animals that were first retested on responding for cocaine under the PR schedule (three sessions) following a ten day abstinence period. A separate group of control male and female rats were given access to saline infusions using the same conditions as those used for cocaine self-administration. Western blotting was used to compare levels of CDK5, PKA and phosphorlated levels of DARPP-32 in the nucleus accumbens and striatum. Preliminary findings reveal sex- and cocaine-specific changes in levels of CDK5 in the nucleus accumbens. Specifically, female control rats had lower levels of CDK5 than did male control rats. Following 'binge' cocaine self-administration, females showed marked increases in motivation to obtain cocaine infusions and they also showed increases in levels of CDK5. In contrast, male rats did not show a change from baseline in motivation to obtain cocaine following 'binge' cocaine self-administration, but they did show a decrease in CDK5 levels. These findings indicate sex differences in molecular consequences of cocaine self-administration that may explain sex differences in cocaine self-administration behavior. Supported by 1K12DA114038-01 (BIRCWH) and other grants from NIDA (DA016556, DA11717).

**Genetic and environmental contributions to amphetamine use in a national twin sample**  
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According to recent treatment admission data the primary amphetamine treatment admission rate in the United States increased from 10 admissions per 100,00 to 52 admissions per 100,000 population aged 12 or older between 1992 and 2002. Given this we examined environmental and genetic contributions to amphetamine use and problem use in an Australian sample, as Australia is a country where use of amphetamines has traditionally been prevalent. Measures of amphetamine use and symptoms of abuse dependence and measures of social, family and individual risk factors were assessed in a sample of 6265 young adult male and female twins born 1964-1971. 20.7% of this sample reported lifetime use of amphetamines with the prevalence of use being significantly higher among males (25.7%) than among females (16.7%; OR=1.7, 95% CI=1.5-1.9). While the majority of those who had used amphetamines reported doing so on only a few occasions, a small minority reported using the drug on at least a weekly basis (5.2% of males vs. 3.3% females, OR=1.6, 95% CI=1.3-2.1) while of 6.5% males and 3.5% females reported experiencing at least one symptom of abuse or dependence (OR=1.9; 95% CI=1.5-2.4). Significant correlates of amphetamine use included: exposure to childhood sexual and physical abuse, conduct disorder, major depressive disorder, suicide attempt and dependence on tobacco, alcohol and cannabis. Standard genetic modeling indicated for males, 45% (95% CI =14-67) of the variance in liability to amphetamine use could be attributed to genetic factors while for females, genetic influences on liability to cannabis use were relatively less important (9%; 95% CI=0-63). Finally, a bivariate Cholesky model estimated a high genetic correlation ( $r=0.72$ ) between the genetic factors associated with amphetamine use and those associated with cannabis use.

**Relationship between quit length, cue-responsiveness and craving in former smokers: a gender analysis**

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Differences in cue-reactivity following smoking abstinence may be predictive of relapse. Previous research suggests that nicotine-dependent males and females respond differently to smoking-cues during acute withdrawal. However, little is known about the effect of gender on cue-reactivity following longer periods of abstinence. To test the hypothesis that there are gender differences, we investigated subjective craving in males and females in four different smoker groups: heavy smokers (HSs; > 10 cigarettes/day) (mean=18 cig/day; mean age=30; n=12), light smokers (LSs; < 10 cigarettes/day) (mean=8 cig/day; mean age=32; n=12), recently abstinent smokers (RAs) (mean quit length=70 days; mean age=35; n=12) and long-term abstinent smokers (LAs) (mean quit length =700 days; mean age=32; n=12). Cue-reactivity was measured under overnight (8-10 hour), 1- and 3-hour forced abstinence in HSs and LSs. Neutral and smoking cues were presented in a standardized environment (lab), and self-reports of subjective craving were collected using the Questionnaire of Smoking Urges (QSU). Initial analyses suggests: a) female RAs report significantly increased intention to smoke following visual smoking-cue presentation ( $p<0.04$ ); b) male LAs report increased expected relief of withdrawal or negative affect ( $p<0.004$ ) and anticipation of positive outcome ( $p<0.04$ ) in response to smoking cues. No gender differences were observed on sub-scales of the QSU in HSs or LSs groups following any abstinence condition, or smoking cue-exposure. Similarly, neither gender in any of the groups, reported an increased desire to smoke following cue presentation. These findings have implications for predicting factors related to relapse to smoking in males and females. Further research is needed to determine the relationship of gender to relapse-risk. Supported by NIH grant DA-13630 and CIHR Fellowships.

### **Women in long-term relationships with drug-using men: the experiences of Indo-Trinidadian women**

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Within the East Indian community in the Caribbean island of Trinidad, the use of cocaine, marijuana and alcohol has been particularly rampant among men, and their female partners have to contend with their drug-using behaviors. To date, no studies have been undertaken in Trinidad that give voice to East Indian women regarding how they manage the experience of being in long-term relationships with drug-using men. This qualitative research gives these women a voice to express how they have previously and presently handle the drug using behaviors of their long-term partners. The objectives of this study are: (1) to understand what it means to be in a relationship with a drug using man; (2) to describe and interpret how women experience being in relationships with drug using men; (3) to demonstrate the types of support women in relationships with drug-using men use and need; (4) to examine the reasons women who are involved with drug-using men stay in the relationship. A theoretically derived qualitative method, situation analysis, is used for both data collection and data analysis. The findings of this study are based on analyses of in-depth interviews with ten women, five men, three key informants, and two community leaders during August 2004 through February 2005. Preliminary analyses found that within the East Indian community, problems are handled differently depending on the family's religious affiliation. Many of the women are in abusive relationships, but are afraid to seek help because of fear of their partner. Their lack of financial independence forces them to stay in these relationships. As well, there are few support services available to partners of drug users. Yet many women have found means of coping such as prayer. The intent of this research is to allow women to express their ways of coping to potentially help others in similar situations; to use their experiences to showcase the need for support services and programs tailored to partners of drug users; and, to foster an environment in which women in similar situations can seek out help and support.

### **Gender and ethnic differences in characteristics of smoking of callers interested in quitting smoking**

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Several studies have investigated differences in smoking characteristics across gender and ethnic groups. Very few have investigated gender and ethnic differences in characteristics of smoking among person interested in participating in quit smoking studies. The purpose of this study was to examine differences of

smoking characteristics and related indices of health and smoking cessation among persons calling into a quit smoking study in a midwest metropolitan area. We hypothesized that there would be few gender or ethnic differences among persons interested in participating in a quit smoking study. Phone screen data was collected from 123 African-Americans (A-A) and 123 White callers (116 men and 127 women in each group, respectively) interested in participating in a quit smoking study. Using t-test and chi-square analysis, racial differences were observed. AA reported higher current age than White callers (39 vs. 34 years of age,  $p=.000$ ), age of initiation (17 vs. 16 years of age,  $p=.001$ ), and chronic disease status such as reported high blood pressure (14% vs. 4%,  $p=.000$ ). In addition AA reported less current use of alcohol (42% vs. 64%,  $p=.000$ ) and current use of prescription drugs (42% vs. 64%,  $p=.003$ ). Gender differences were also observed on several variables. More women reported higher prescription drug use (63% vs. 42%,  $p=.002$ ), treatment for psychiatric or emotional problems (36% vs. 16%,  $p=.000$ ), and use of medication related to psychiatric or emotional problems (41% vs. 18%,  $p=.001$ ). However, few gender by race interactions were observed.

### **Relative power and marijuana use within adolescent sexual partnerships**

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**Introduction:** Individuals who hold more power in their romantic relationship may influence their partners' marijuana use. The objective of this study was to investigate whether power imbalance within an adolescent romantic relationship is associated with the concordance in the couple's marijuana use. **Methods:** Adolescents were aged 14 to 19 years, 84% female, and African American. Relative power was measured in two ways. First, couples where the desire for emotional intimacy was not equal were considered to have a power imbalance. Emotional intimacy was measured using a 10-item emotional intimacy scale (Chronbach's  $\alpha = .90$ ). Participants reported on their desire for emotional intimacy and their perceptions about their partner's. The second measure of power imbalance was a 9-item decision-making power scale (Chronbach's  $\alpha = .69$ ). Marijuana use concordance was defined as either both using or both not using marijuana in past three months. Again, participants reported on their marijuana use as well as their partner's. **Results:** Sixty-four percent of the partnerships were concordant on marijuana use. Using relative emotional intimacy and decision making power measures, respectively, 49 and 54% of the participants reported having greater power, 20 and 39% equal power, and 31 and 7% less power than their main partner. Using logistic regression, controlling for gender, adolescents reporting a greater relative emotional intimacy were more likely to be concordant on marijuana use (OR: 1.64, 95% CI: 1.05, 2.56). Adolescents reporting less decision making power than their partner were also more likely to be concordant on marijuana use (OR: 1.67, 95% CI: 0.99, 2.82). **Conclusions:** Adolescents who experience less power relative to their sexual partners reported greater concordance with their partner's drug use behavior. Desire for intimacy may have a profound influence on the adaptation of substance use behaviors within relationships; however, further longitudinal research is needed to determine the directionality of this influence. Funded by NIDA award: T32DA07292

### **Incident cases of ecstasy use in the United States, 2003**

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**BACKGROUND:** Epidemiological surveillance data gathered by SAMHSA (e.g., National Survey on Drug Use and Health, NSDUH) signal a recent apparent dip in risk of becoming an ecstasy user in the United States. Nonetheless, during 2003, against population-level trends, a considerable number of young people in the US started to use ecstasy (for the first time). **AIM:** Extending our research group's prior work on the characteristics of ecstasy users in the earliest stages of diffusion of this drug, we seek to understand characteristics of these newly incident ecstasy users during a period of declining annual incidence. **METHODS:** Data are from the just-released public use survey files for 2003 and include 163 newly incident ecstasy users ('cases' with onset in 2003), identified from among 55,230 community-dwelling participants. Contingency table analyses and multiple regression models with Taylor series linearization for variance estimates have been used to compare and contrast the newly incident cases with other segments of the population. **RESULTS:** With application of proper survey analysis weights, the 163 newly incident

ecstasy users in this sample project to slightly more than 2.5M newly incident users in U.S. communities, down from considerably larger NSDUH estimates for 2001-2002. Nonetheless, as in past years, the male-female ratio is balanced (roughly 50:50) among cases as in the community. As in past years, there is markedly excess risk of starting ecstasy use among 18-20 year olds, but no apparent excess risk for students in school (e.g., college) versus individuals not in school. Our initial analyses show modest excess risk of newly incident ecstasy use in association with an index of serious mental illness, as noted previously. DISCUSSION: Despite the observed dip in risk of becoming an ecstasy user in the US, the profile of the associated characteristics of newly incident users is not markedly different from what was observed in prior years. Acknowledgment: NIDA awards D43TW05819; K05DA015799.

### **Gender differences in sources of prescription drugs for illicit use**

**S.E. McCabe and C.J. Boyd**

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There is growing evidence that the illicit use of prescription drugs has been increasing in the past decade among U.S. college students (Johnston et al., 2004; Mohler-Kuo et al., 2003). This exploratory study investigated the sources of four classes of abusable prescription medication (sleeping, sedative/anxiety, stimulant, and pain medications) that were used illicitly by undergraduate students and examined the potential gender differences between these sources. In the spring of 2003, a Web-based survey was completed by a randomly selected sample of 9,161 undergraduate students attending a large public Midwestern research university in the United States. Data included self-reports of nonmedical use of prescription drugs and other substance use behaviors. The study identified 18 sources of prescription drugs that were classified into three broad categories: peer, family, and other sources. For both undergraduate men and women, the majority of illicit users obtained each class of prescription drugs from peer sources. Women were more likely than men to obtain the following prescription medication from family sources: sedative/anxiolytic medications (14.6% vs. 4.8%,  $\chi^2=6.97$ ,  $df=1$ ,  $p < 0.01$ ), sleeping medications (24.2% vs. 7.5%,  $\chi^2=7.80$ ,  $df=1$ ,  $p < 0.01$ ) and pain medications (16.4% vs. 7.4%,  $\chi^2=15.05$ ,  $df=1$ ,  $p < 0.001$ ). For both undergraduate men and women, illicit users who obtained prescription medication from peer sources reported significantly higher rates of alcohol and other drug use than students who did not use prescription drugs illicitly or those illicit users who obtained prescription medication from family sources. The findings of the present study provide evidence for gender differences in sources of prescription drugs for illicit use. Undergraduate students are clearly obtaining abusable prescription drugs from their peers and more efforts are needed to reduce the illicit use and diversion of prescription medication. This project was supported by the University of Michigan and a research grant DA018239 (PI: Sean Esteban McCabe) from the National Institute on Drug Abuse.

### **Acute effects of testosterone and progesterone on cocaine self-administration by female rhesus monkeys**

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Gonadal steroid hormones influence some of cocaine's behavioral effects in preclinical studies (Lynch et al., 2002; Mello and Mendelson, 2002). Testosterone has mood-elevating effects in men and post-menopausal women, whereas high levels of progesterone are often associated with dysphoric effects in women (Mello and Mendelson, 2002). The present study was designed to evaluate the effects of acute administration of testosterone and progesterone on cocaine self-administration by female rhesus monkeys. We examined the effects of single doses of testosterone (0.001-0.01 mg/kg, i.m.) and progesterone (0.1, 0.2 and 0.3 mg/kg, i.m.) on cocaine self-administration dose-effect curves (0.001-0.3 mg/kg/inj). Each monkey served as her own control across gonadal steroid hormone treatment conditions. Cocaine self-administration (0.10 mg/kg/inj) was maintained on an FR30 schedule of reinforcement, and monkeys had unlimited access to cocaine during one 2 hr session each day. Testosterone or progesterone was administered before each test session, twice each week on Tuesday and Friday. Cocaine doses were administered in an irregular order during each cocaine dose-effect determination, and the same dose order was used in an individual monkey in all treatment conditions. Blood samples for hormone analysis were collected at the end of each test session. Preliminary findings indicate that both testosterone (0.001-0.01 mg/kg, i.m.) and progesterone (0.2 and 0.3 mg/kg, i.m.) produced a downward and rightward shift in the



cocaine self-administration dose-effect curve. Progesterone administration also decreases ratings of positive subjective effects after smoked cocaine in women (Evans and Foltin, 2002), but the interactions between testosterone and the subjective effects of cocaine are unknown. This research was supported in part by R01-DA14670, P01-DA14528, K05-DA00101 and K05-DA00064 from the National Institute on Drug Abuse, NIH.

### **The effects of cigarette smoking on mood states and the HPA axis during menstrual cycle phase**

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Twelve healthy adult women who met DSM-IV criteria for nicotine dependence provided informed consent for participation in studies designed to examine if menstrual cycle phase influenced the acute effects of cigarette smoking on subjective and neuroendocrine measures. Six follicular phase women (progesterone =  $0.73 \pm 0.15$  ng/ml) and six luteal phase women (progesterone =  $9.18 \pm 1.55$  ng/ml) were studied after overnight abstinence from smoking. Baseline carbon monoxide levels were less than 5 ppm and did not differ significantly between the two groups. Women smoked a commercially available, high dose nicotine cigarette under controlled conditions. Subjects took one 5 sec puff every 30 sec for 12 min. Plasma nicotine levels increased significantly within 4 min ( $P < 0.05$ ), and remained significantly above baseline levels throughout the 120 min study session. Peak plasma nicotine levels were equivalent in the two groups of women, and averaged  $23.4 \pm 5.4$  ng/ml and  $24.3 \pm 2.2$  ng/ml. Heart rate increased significantly from baseline within 2 min ( $P < 0.05$ ) and there were no differences between follicular and luteal phase women. However, cigarette smoking produced higher ratings of positive subjective effects on a Visual Analogue Scale (VAS) in follicular phase women than in luteal phase women. VAS ratings of High and Rush were higher in follicular than in luteal phase women. ACTH peak levels were also higher in follicular than in luteal phase women. Plasma levels of ACTH increased significantly within 14 min after smoking began and ACTH increases were followed by significant increases in cortisol and DHEA ( $P < 0.05$ ). Cortisol and DHEA were also higher in follicular phase women than in luteal phase women. These findings suggest that menstrual cycle phase modulates the effects of cigarette smoking on mood states and neuroendocrine hormones in women. There are many similarities between the subjective and endocrine effects of cigarette smoking and i.v. cocaine (Jones et al., 1999; Mendelson et al., 2003). These preliminary findings are consistent with clinical and preclinical reports that high levels of progesterone during the luteal phase and/or progesterone administration may attenuate subjective reactions to cocaine and decrease cocaine self-administration (Evans and Foltin, 2002; Mello et al., 2004).

### **Newer smokeless tobacco products compared to medicinal nicotine: Health and behavioral consequences**

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Background: Although smokeless tobacco has the potential to be used as a harm reduction method for cigarette smokers, it still contains toxins and is consequently not harmless. Thus, it is important to further examine health effects, risks and benefits of these products, and compare them with existing medicinal nicotine products. Methods: Thirty nine participants were randomized to use either Exalt tobacco packets or Commit medicinal nicotine lozenge and 26 participants were randomized to use either Ariva compressed powdered tobacco lozenge or Commit. Participants were asked to continue smoking their own brand of cigarettes for at least 1 week, were randomly assigned to quit smoking and use either smokeless tobacco (Exalt and Ariva) or Commit nicotine lozenge for 2 weeks, then crossed over to use the other product for two weeks. At the end of this sampling phase, subjects underwent a product choice week. Assessments were made weekly during baseline cigarette use and 5 weeks of treatment. Outcome measures included subjective and behavioral responses. Bodily samples were obtained to examine biochemical markers of tobacco exposure. Results: Data has been analyzed on participants who met the inclusion criteria and completed the study. Weekly ratings on drug liking and on withdrawal symptoms showed no significant differences between Exalt or Ariva and Commit. Participants who use Exalt and Commit perceived the first product to which they were assigned as affording more relief from withdrawal and urges to smoke and as

easier and more satisfying to use while those who used Ariva and Commit found Ariva as easier and more satisfying to use. During choice week, the participants who used Exalt and Commit preferred Commit more than Exalt in subjects assigned to Commit initially; and equal preferences for the two products were observed in subjects assigned to Exalt initially. The participants who used Ariva and Commit preferred Ariva regardless of which product they were assigned initially. Conclusion: Both Exalt or Ariva and nicotine lozenge produced similar subjective effects. Commit was preferred more than Exalt but less preferred than Ariva. Funded by P50 DA13333.

### **Trait anxiety and marijuana use in pregnant women**

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The purpose of this study was to examine the relationship between trait anxiety and marijuana use in pregnant women. The sample included 413 pregnant women seeking care at an urban OB/GYN clinic. All women provided informed consent and self-report data were collected with a questionnaire battery, which included the State-Trait Anxiety Inventory (STAI) and a Health Behavior Survey that assessed for substance use including marijuana (time since last use). Nearly half of the sample (N=185; 44.8%) reported marijuana use. The mean STAI trait anxiety score for all women was 42.1 (SD = 10.4) and analyses were performed using a dichotomous grouping of those women with STAI scores below (low trait anxiety) and above (high trait anxiety) the mean score. Chi square analysis compared women with high (N = 92) and low (N = 93) trait anxiety. Women with high trait anxiety were more likely to report marijuana use within the past month (74.2% vs. 25.8%) and past 6 months (63.5% vs. 36.5%) as compared to women with low trait anxiety ( $p < .01$ ). Also, women in their second trimester who had high trait anxiety reported more recent marijuana use compared to women with low trait anxiety ( $p < .05$ ). Finally, among women with unplanned pregnancies, significantly more women with high trait anxiety (74.1% vs. 25.9%) had smoked marijuana within the past month as compared to women with low trait anxiety ( $p < .05$ ). This relationship between high trait anxiety and recent (within past 6 months) marijuana use warrants further study. Screening for trait anxiety in pregnant woman may help to identify prenatal behavioral risk factors such as drug use. From a practitioner's standpoint, these results suggest that treatment for anxiety may be useful for pregnant women. This research supported by NIH grants DA11476 and AA 11802.

### **Trauma histories among california women inmates**

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The extent to which traditional therapeutic community (TC) methods meet the specialized treatment needs of drug-dependent women in prison is largely unknown. Drug-dependent women offenders entering prison treatment programs often report severe levels of polydrug abuse, psychological impairment, and histories of sexual/physical abuse. In fact, a large percent of these women meet the criteria for post-traumatic stress disorder. The trauma that results from early victimization increases the risk of interpersonal violence in women's adolescent and adult relationships and is a strong predictor of subsequent substance abuse and criminal activity. The purpose of this study is to identify specific traumatic events that are most prevalent over the life course of incarcerated women offenders. In-depth baseline interview data for 316 women inmates from the Central California Women's Facility were conducted, including the Life Stressor and the Trauma Symptom Checklist. Chi-square analysis and t-tests will identify life history data for those who were (171) and those who were not (145) in prison-based treatment. Self-report data come from a 5-year process and outcome evaluation of the California Department of Corrections treatment expansion initiative. Thirty-six percent of the treatment group women were identified with co-occurring substance abuse and psychological disorders. None of the women in the comparison group met criteria for a psychiatric disorder. Yet, similar numbers of women in the two groups reported sexual and physical abuse in childhood and adulthood (42% treatment group and 40% comparison group). Preliminary findings within the treatment group show that women with psychological impairments were most likely to be reincarcerated within 12-months of their parole, compared with women with no psychological impairments. Further data analysis is currently being conducted and will be available at the time of the presentation.

## **Maternal maltreatment, substance abuse, and child's dysregulation**

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Maltreated children are at high risk for psychological and physiological dysregulation as well as early onset substance use disorder (SUD). Psychological and physiological dysregulation usually precedes SUD. Children at high risk for early onset SUD because of family SUD are characterized by psychological and physiological dysregulation. The majority of studies of high risk children have been conducted in children of SUD fathers. Thus, the principal objective of this study was to determine the relative contribution of physical neglect and abusive parenting in interaction with negative parental attitude to the affective, behavioral, and physiological dysregulation in the 1-6 year-old offspring of 19-23 year old young women with adolescent onset SUD (age 14-18). The average age, number of years of education, and level and socioeconomic status (SES) are 21.2 (sd=1.5) years, 12.6 (sd=1.6) years, and 33.4 (11.7) respectively. The ethnic composition is 63% Caucasians, 31% African Americans, and 6% other ethnic background. The average age of the offspring is 2.7 years (sd=1.6). The multiple regression revealed that controlling for current substance use (SU) involvement severity and SES level, abusive parenting (Beta=.33,  $p<.001$ ) and negative parental attitude (Beta=-.17,  $p<.05$ ) were directly related to the offspring's dysregulation. The model explained 16% of the total variance of offspring's dysregulation ( $F=5.5$ ,  $p<.001$ ). The interaction of negative parental attitude with abusive parenting and physical neglect was not significantly related to offspring's dysregulation. In conclusion, regardless of SES level and severity of SU involvement, abusive parenting and negative parental attitude are related to the 1-6 year old offspring's dysregulation of adolescent onset SUD women. Training adolescent onset SUD young adult women in parenting and self-regulation skills may prevent the development of dysregulation in the offspring that may result in early onset SUD.

## **Assessment of substance abuse risk factors in 9-year-old prenatally drug-exposed children using the ALEXSA**

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Children prenatally exposed to cocaine (C+) may be at risk for early substance abuse due to the negative effects of cocaine on fetal development. ALEXSA, a computerized self assessment of substance use and risk factors for children ages 9-12 was given to 121 C+ and 120 C- 9-year old, African American, urban, low SES subjects. Substance use, conduct disorder, depression, irritability, disinhibition, thrill seeking, tolerance of deviancy, impulsiveness, inattention, academic competence, and parental attachment and permissiveness were assessed. Group comparisons were examined using t-tests and chi-squared tests. Linear and logistic regressions were used, controlling for covariates. Groups were not different for the # of children who tried alcohol (8.3% C+ vs. 8.3% C-), tobacco (0% C+ vs. 3% C-) or marijuana (2% C+ vs. 0% C-). Gang exposure score was greater for C+ children compared to C- (.34 vs. .21;  $p<.05$ ). No specific negative effects of cocaine exposure were found when controlling for confounders. Higher caregiver cigarette use was positively associated with knowing someone in a gang ( $p<.02$ ). Child self report of greater conduct disorder was positively associated with higher prenatal alcohol exposure ( $p<.003$ ) and negatively with cocaine exposure ( $p<.10$ ). Increased thrill and adventure seeking was positively associated with higher maternal performance IQ ( $p<.002$ ) and lower caregiver cigarette use ( $p<.01$ ). Higher tolerance of deviancy was associated with lower SES ( $p<.001$ ) and higher caregiver cigarette use ( $p<.05$ ). Greater inattention was associated with 3rd trimester marijuana exposure ( $p<.03$ ), and academic competence was predicted by higher caregiver cigarette use ( $p<.02$ ). Higher maternal education was positively associated with parental attachment ( $p<.02$ ) and negatively associated with depression ( $p<.02$ ). At age nine, prenatal cocaine exposure is not a specific risk factor for early substance use or risk. Current caregiver drug use and other prenatal exposures are associated with substance abuse risk.

## **Gender and impulsivity in cocaine-dependence treatment outcomes: A multistudy analysis**

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Gender differences in cocaine effects have been observed in both animal and human laboratory studies. In addition, treatment-seeking cocaine users also differ by gender. Recently, the role of impulsivity in the initiation and persistence of stimulant use has been reported, but its interaction with gender has been little examined. In 6 clinical trials for cocaine dependence, we administered the Dickman Impulsivity Inventory (DII), yielding Functional and Dysfunctional Impulsivity (FI, DI) scores. The purpose of the current analyses was to describe gender and impulsivity in cocaine-dependent patients (N = 450, 28% female) and to evaluate the influence of these variables in predicting cocaine use (cocaine urines) and treatment completion (days of treatment). Using Poisson regression, we evaluated models that included demographic variables, cocaine dependence severity, gender, impulsivity, and gender's interaction with impulsivity. Baseline differences in gender showed lower levels of FI and higher levels of DI in females ( $p < .05$ ). Significant predictors ( $p < .05$ ) of cocaine use included, age, cocaine positive status on intake, and route of administration, while race predicted treatment completion. Re-examination of the factor structure of the DII was conducted by exploratory factor analysis on a random sub-sample followed by confirmatory factor analytic cross-validation on the remaining hold-out sample: A three factor solution resulted (RMSEA = .06, CFI = .90). Re-analysis of the data employing these new factor scores was conducted, but impulsivity and gender still failed to predict outcomes. Despite baseline gender differences in impulsivity, these factors did not predict cocaine use or treatment completion in this self-selected sample. Gender and impulsivity may still prove important factors in treatment success, when evaluated in more representative samples, using other measures of impulsivity, including delay discounting and psychophysiological approaches.

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### **Frequency of marijuana use predicts retention and treatment outcome in office-based buprenorphine treatment for opioid dependence**

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Prior research on the impact of marijuana use on opiate agonist maintenance treatment has reported conflicting findings: Some studies found poorer outcome in methadone maintenance and greater likelihood of relapse among marijuana users (Wasserman, et al., 1998; Kotzker, et al., 1979), while others found little or no relationship (Epstein & Preston, 2003; Weizman et al., 2004). To date, no studies have examined whether marijuana use affects treatment response in office-based buprenorphine maintenance or whether the effects of marijuana on outcome depend on severity of its use. We examined opioid dependent individuals who initiated treatment in a 24-week randomized clinical trial in a primary care clinic. Since THC was not included in weekly urine screens conducted in the study, we examined frequency of self-reported weekly marijuana use among only those individuals who reported some marijuana use (N = 72). Participants reported marijuana use on a mean of 7.6 weeks during treatment (SD = 6.4, Range 1 to 26). Correlation and multiple regression were used to examine weeks marijuana use with demographic variables, substance-use characteristics and risk factors, and treatment outcomes. Greater weeks of marijuana use was associated with younger age (.02), fewer consecutive weeks of opiate negative urine screens ( $r = -.33$ ,  $p = .005$ ) and cocaine negative urine screens ( $r = -.32$ ,  $p = .006$ ), less likelihood of completing treatment ( $r = -.32$ ,  $p = .006$ ) and fewer days in treatment ( $r = -.41$ ,  $p < .001$ ). Number of weeks of marijuana use during treatment was not associated with gender (.46), employment (.62), race (.25), years of opiate use (.96), injection drug use (.78), and prior methadone maintenance (.84). In stepwise multiple regression analyses only age and days in treatment were significant associated with number of weeks of marijuana use. We conclude that individuals who use marijuana more frequently during office-based buprenorphine treatment have poorer retention and poorer treatment outcome. Supported by R21 DA 019246 (BM) RO1DA09803 (RS).

### **Environmental enrichment affects nicotine's activity stimulating actions in males and females differently**

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There is increasing evidence that environmental factors (e.g., enriched versus isolated housing) alter the

stimulatory properties of nicotine in rats. However, the extent in which these environmental factors affect nicotine's actions in male versus female rats remains unknown. The present experiment evaluated the effects of housing conditions on nicotine-induced open field activity in isolated, socially housed and environmentally enriched (housed with same sex rats and toys) male and female rats. Specifically, 72 male and female Sprague-Dawley rats were housed in one of three housing conditions (isolation, social, or enriched) for two weeks. On day 15 of housing, animals were given 12 daily injections (SC) of saline, 0.1 mg/kg, 0.5 mg/kg, or 1.0 mg/kg nicotine. Open field activity was measured for one hour immediately following nicotine (or vehicle) injections on drug administration days 2, 6, 10, and 12. The results indicate that, in comparison to socially and enriched housed male rats, male rats housed in isolated environments are significantly more sensitive to the activity-enhancing effects of nicotine. That is, nicotine's stimulatory actions appear after fewer drug exposures and at lower doses (0.1 mg/kg and 0.5 mg/kg) for male rats housed in isolation versus those housed socially or in enriched environments. Conversely, in comparison to female rats raised socially and in isolation, female rats raised and housed in enriched environments appeared more sensitive to nicotine's stimulatory properties. Specifically, for enriched female rats, the stimulatory effects of nicotine were evident at a wide range of doses (0.1 mg/kg and 1.0 mg/kg) after the first injection, an effect not seen in animals in the other conditions. These findings indicate that environmental influences on nicotine's stimulatory actions are not only different for males and females, but differ based on the type of environment in which they are housed. This work was supported in part by a grant from the Uniformed Services University of the Health Sciences to NEG.

#### **Role of P glycoprotein in transplacental transfer of Methadone**

**T.N. Nanovskaya, I.A. Nekhayeva, N. Karunaratne, K. Audus, G.D.V. Hankins and M.S. Ahmed**  
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Methadone is the therapeutic agent of choice for treatment of the pregnant opiate addict. However, little is known on the factors affecting its concentration in the fetal circulation during pregnancy and how it might relate to neonatal outcome. Therefore, a better understanding of the function of placental metabolic enzymes and transporters should add to the knowledge of the tissues' role in the disposition of methadone and its relation to neonatal outcome. The goal of this investigation was to determine whether the expression and activity of the efflux transporter P-glycoprotein (P-gp) localized in trophoblast tissue affects the transplacental transfer of methadone. Data obtained utilizing the ex vivo technique of dual perfusion of placental lobule and in vitro monolayers of the trophoblast like BeWo cell line indicated that methadone is a substrate of P-gp. The transfer of methadone to the fetal circuit was increased by 30% in presence of the P-gp inhibitor GF120918 while the transfer of paclitaxel (taxol), a known substrate of P-gp, was increased by 50%. The role of P-gp was confirmed utilizing the trophoblast like BeWo cell line where the uptake of methadone and taxol was also increased in presence of the P-gp inhibitor cyclosporin A. Moreover, the expression of P-gp in placental brush border membranes varied between term placentas. These data indicate that the concentration of methadone in the fetal circuit of the dually perfused placental lobule is dependent on the expression and activity of P-gp. Therefore, if the above conclusion, based on ex vivo and in vitro data, is true in vivo then the concentration of methadone in the fetal circulation during gestation will be affected by the activity of the efflux transporter P-gp. Accordingly, it can be assumed that the incidence and intensity of neonatal abstinence syndrome could also be affected, at least in part, by the expression and activity of P-gp. Supported by grants from NIDA to MSA and NICHD to K.A.

#### **Sex differences in behavioral sensitization to cocaine**

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Behavioral sensitization is a model for understanding the changes that occur during the development of cocaine addiction. Sex differences in the development and maintenance of behavioral sensitization to cocaine have been shown with daily single injections of the drug. However, little is known about how a more chronic and intense cocaine administration paradigm may affect sex differences in cocaine sensitization. To address this question, male and female rats were randomly divided into three treatment groups: saline (14 days, twice daily i.p., 0.9% saline), chronic cocaine (14 days, twice daily, 15 mg/kg, i.p.) or acute cocaine (13 days of saline treatment followed by one injection of cocaine 15 mg/kg, i.p.). Immediately following drug treatment, behavioral responses to cocaine (ambulation, rearing and

stereotypic behaviors) were monitored for 60 minutes in automated activity chambers. Male rats developed sensitization only to cocaine-induced ambulatory activity. Female rats, on the other hand, did not demonstrate behavioral sensitization to ambulatory activity, whereas they demonstrated tolerance to rearing activity. Chronic and acute cocaine administration produced similar stereotypic behavioral scores in male and female rats. Cocaine-induced behavioral tolerance in female rats is likely due to their greater sensitivity to the psychostimulant actions of cocaine. We build on previously published results by demonstrating that female rats do not develop locomotor sensitization with intense cocaine administration. Support Contributed by SCORE 506-GM60654, and SNRP NS41073.

### **Effect of nicotine-specific antibodies, Nic311 and Nic-IgG, on the transfer of nicotine across human placenta**

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The adverse effects of smoking during pregnancy are, in part, due to nicotine. The effects of nicotine on fetal development may be due to its concentration in the circulation and/or that on placental functions. In the pregnant rat, vaccination with a nicotine immunogen reduced the transfer of nicotine from the maternal to fetal circulation. The goal of this investigation is to determine the effect of nicotine-specific antibodies on the transfer of nicotine from the maternal to fetal circuit of the dually perfused placental lobule. Two types of nicotine-specific antibodies were investigated; nicotine-specific mouse monoclonal antibody (Nic311, Kd for nicotine 50 nM) and IgG from rabbits vaccinated with a nicotine immunogen (Nic-IgG, Kd 1.6 nM). The utilized term placentas were divided into three groups according to the transfused compound(s): First, control; Second, nicotine+Nic311 and Third, nicotine+Nic-IgG. The concentration of nicotine (40 ng/ml) used is that reported in the circulation of smokers. Both the maternal circuit (MC) and fetal (FC) of the placental lobule were re-circulated. In control placentas (First group), 14.4±3.2% of the initial dose (ID) of nicotine added to the MC was transferred to the FC and its concentration ratio in the FC/MC was 0.79±0.16. In the Second (nicotine+Nic311), only 6.17±0.7 % of the ID of nicotine was transferred to the FC and FC/MC was 0.2±0.03. In the Third (nicotine+Nic-IgG), nicotine transfer to the FC was even lower (2.2±0.67% of its ID) and the FC/MC ratio was 0.06±0.02. The accumulation of nicotine in the perfused tissue in presence of either Nic311 or Nic-IgG antibodies was 25% of that in their absence. These data suggest that both Nic-IgG and the lower affinity Nic311 reduces nicotine transfer from the MC to FC of the perfused lobule and support a potential protective role of maternal immunization for the nicotine-exposed fetus. Supported by grants from NIDA to P.P. and M.S.A

### **Gender and ethnic differences in treatment utilization, satisfaction and outcomes among methamphetamine abusers**

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This prospective longitudinal study examined service needs, utilization, satisfaction and treatment outcomes among 188 Hispanic (107 women and 81 men) and 577 White (325 women and 252 men) methamphetamine abusers admitted to 43 drug treatment programs in California. Data were collected at intake and at 3 months and 9 months after admission into treatment. The Addiction Severity Index (ASI) was administered at both intake and the 9-month follow-up interview to assess client's problem severity or service needs, and Treatment Service Review was given to a sub-sample at the 3-month interview to measure service utilization and satisfaction. Results show that upon entry into treatment, women are presenting with higher ASI scores than men in the following domains: employment, family/social, and psychiatric. Whites are presenting with significantly greater psychiatric problems than Hispanics. Conversely, Hispanics present with higher employment ASI scores than Whites. Service utilization and satisfaction data collected at the 3-month follow-up revealed that gender was a significant predictor of whether the individual received psychiatric and social services with more women receiving such services than men. Ethnicity was a significant predictor of whether the individual received employment services, with more Whites receiving such services than Hispanics. There were no gender or ethnic differences in treatment satisfaction. In terms of treatment outcome, controlling for baseline ASI scores, we found that gender was a significant predictor of employment and legal outcomes with men having better work

outcomes than women and women having better legal outcomes than men. Additionally, ethnicity was a significant predictor of alcohol and family/social outcomes with Whites having fewer alcohol problems than Hispanics and Hispanics having fewer family/social problems than Whites. Implications for service improvement will be discussed.

### **Ovarian hormones modulate levels of dopamine and turnover rates after acute cocaine administration**

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Previous studies have demonstrated that estrogen (E) and progesterone (P) alone affect cocaine-induced behavioral activity in a dose-dependent and temporal manner. In this study, E + P were co-administered at different ratios to determine whether hormonal interactions in the estrous cycle contribute to cocaine-induced alterations in behavior and in the dopamine system. Prior to an acute injection of cocaine (15 mg/kg; i.p.) or saline, ovariectomized female rats received vehicle (sesame oil), or E (10 g or 50 g; 48 hours; s.c.) and P (100 g or 500 g; 24 hours; s.c.). When animals were administered 50 mg E + 500 mg P (levels reflecting those observed during the late proestrus stage), total locomotor behavior was enhanced while levels of dopamine (DA) in the nucleus accumbens and the ratio of HVA to DA in the VTA were decreased. Administration of 10 mg E + 500 mg P (levels reflecting those observed during the diestrus stage) inhibited total locomotor activity and decreased baseline levels of DA. This study suggests that alterations in dopamine tone, as a result of E and P interactions, may underlie the observed changes in cocaine-induced behavior during the estrous cycle. This research was supported by NIH/MARC 5 T34 GM07823-23, PS-CUNY, RR-03037, NIDA DA 12136, SCORE 506-GM60654, and SNRP NF 39534.

### **Drug-dealing and recent-onset cannabis users in the U.S, 2003: A re-approach based on a nationally representative sample of 1,244 youths**

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AIMS: Epidemiological diffusion of illegal drug-taking in a population can accelerate when newly incident drug users join illegal drug distribution networks. In this study, we build from our research group's 'late-breaking research' presented at CPDD's June 2004 scientific meeting. For that report, based upon data from the CY2002 National Survey on Drug Use and Health (NSDUH), we found that an estimated 10% of recent-onset cannabis users age 10-17 years had become illegal drug dealers, with greater odds of dealing seen for males, and for gang fighting youths, those with lower school grades, and those with drug dependence. Here, we draw upon just-released NSDUH data from CY2003. METHODS: Among >55,000 community participants, 1244 youths 12-17 yrs old were recent onset cannabis users (i.e., initiation within 24 months of assessment). Contingency and regression analyses provided estimates. RESULTS: Estimates mainly confirm the 2002 results: (i) an estimated 10% of recent onset cannabis users had become drug dealers, with greater odds for males v. females (14% vs. 6.6%,  $p < 0.01$ ). (ii) Odds of drug dealing were associated with gang-fighting ( $p < 0.01$ ), and less robustly, with religiosity ( $p = 0.06$ ) (iii) Recent-onset cannabis users with rapid-onset cannabis dependence were more likely to be drug dealing ( $p < 0.01$ ); other drug dependence had associations that were either null or not statistically robust (i.e.,  $p > 0.05$ ). DISCUSSION: This study strengthens and confirms prior evidence that a small minority of young people are dealing illegal drugs soon after onset of cannabis use. New users who deal are epidemiological 'vectors' who share illegal drug involvement with others. Public health interventions to address drug dealing soon after onset of cannabis use will be more challenging to the extent that the drug-dealing youths are cannabis dependent, disengaged from conventional social norms and from bonds to social structures such as school and church. NIDA T32 DA07292, K05DA015799; MSU research fund.

### **A multivariate look at drug dealing among multi-problem female youths in the US, CY2003**

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BACKGROUND & AIM: A November 2004 SAMHSA report on female youths, based on CY2003 data

from the National Survey on Drug Use and Health (NSDUH), observed that 2%-3% had recently sold illegal drugs, using an analysis approach that treated each conduct problem 1-by-1. Here, we study drug dealing using latent class analyses (LCA). METHODS: Data are from public use files of NSDUH2003; 8,759 12-17 yr old community-dwelling females were sampled and answered standardized questions on six recently active CP: serious fighting (SF), group-fighting (GF), serious attack on others (SA), stealing something worth > \$50 (S\$50), dealing illegal drugs (DD), carrying handguns (CH). RESULTS: LCA analyses, via LatentGold software, disclosed a three-class solution of best fit. There was a low prevalence multi-problem class, 1.4% of the females. Within this class, for DD and S\$50, prevalence was 60%-70%; for HG, it was 40%. By comparison, in a 'minimal problems' class (81% of females), and a 'fighting' class (18% of females), the within-class prevalence of DD, S\$50, and CH all were under 4%. In the small class with high DD prevalence, fighting was even more prevalent: 86% for SF; 81% for GF, and 80% for SA. In the class with fighting but no DD, the values were 75% for SF, 57% for GF, and 24% for SA. Values for the 'minimal problems' class were 8% for SF, 8% for GF, and 2% for SA. DISCUSSION: Drug dealing among female youths in the US is concentrated within a relatively low prevalence (1.4%) subgroup with multiple conduct problems; outside of that subgroup, DD, S\$50, and CH occur rarely. It is notable that 80% of this small subgroup also engages in gang or group fighting. In plans for public health and safety interventions to reduce diffusion of youthful drug use, it will be important to understand female drug dealing in this multivariate context. SUPPORT: NIDA D43TW005819, T32 DA07292, K05DA015799, MSU research funds.

### **A computer-based brief motivational intervention for perinatal drug use: Preliminary results from a phase II clinical trial**

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The present study is an examination of the response of postpartum women with histories of drug use to a single-session computer-based motivational intervention. As part of an ongoing clinical trial, a total of 45 postpartum women who reported drug use in the month prior to pregnancy were evaluated at baseline (prior to leaving the hospital) and at a 3-month follow-up. At both observations, data were collected using a Tablet PC (laptop with integrated touch screen); at baseline, half of participants were randomly assigned to also complete a 20-minute computer-based motivational intervention with three components: decisional balance, in which the pros and cons of drug use for the participant are elicited; normed feedback, in which the participant's drug use and related consequences are compared to national norms; and optional goal-setting, in which the participant, if willing, is guided through a self-directed goal-setting process. Participants in the intervention condition also received two non-tailored brochures by mail that addressed health issues, including drug use, in a broad and non-threatening manner. At 3-month follow-up, there was no difference between groups in either self-report of marijuana use over the past 3 months (77.8% across groups), or evidence of marijuana use by urinalysis (78.0% across groups). However, women in the intervention condition were significantly less likely to report use of cocaine, opiates, or amphetamines in the past 3 months (20.8% vs. 0%;  $p = .04$ , Fisher's Exact Test), a finding receiving partial support from urinalysis results (14.3% of control condition urine samples were positive for cocaine, opiates, or amphetamines, vs. 5.0% in the intervention condition;  $p = .32$ , Fisher's Exact Test). Intervention effect size for hard drug use as indicated by urinalysis was  $d = .29$ . While preliminary, these results are encouraging regarding the potential usefulness of this low-cost, high reach, and highly replicable intervention in primary care.

### **Gender specific effects in the effects of child maltreatment on cocaine relapse outcomes**

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Purpose: The study examined gender specific associations between different types of child maltreatment and relapse outcomes (time to relapse, frequency and amount of use) in cocaine dependent men and women at 90 days following inpatient treatment. Participants and Method: Participants were administered the Childhood Trauma Questionnaire-Short Form (CTQ-SF), the SCID-I, and a baseline demographics interview at the beginning of inpatient treatment and followed for 90 days following discharge from inpatient treatment to obtain relapse outcomes. Results: Days of cocaine use and amount of cocaine used at



follow-up did not differ by gender. In men, time to relapse was associated with the severity of childhood physical neglect. In women, severity of sexual abuse and physical neglect were associated with number of days of cocaine used upon relapse. Also in women, the average amount of cocaine used at follow-up was associated with the severity of emotional, sexual, and physical abuse. All these associations were significant even after adjusting for baseline cocaine use measures and lifetime PTSD. Conclusions: In men, child maltreatment impacts time to relapse but not the frequency of use or the amount of cocaine used following a relapse. In women, child maltreatment affects the frequency and amount of cocaine used following a relapse. In all, different types of maltreatment have a differential affect on cocaine relapse and subsequent drug use for men and women. Findings support a gender-specific effect of child maltreatment on relapse outcomes in cocaine dependent individuals. These findings support the need to develop gender specific treatments in addressing relapse prevention in cocaine dependence. (Supported by P50-DA016556, R01-DA011077, K02-DA17232).

### **Medication adherence in co-occurring disorders**

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We sought to determine the relationship between baseline demographic and clinical characteristics, and adherence patterns of individuals referred to an ongoing randomized clinical trial of 3 adherence-enhancement treatments. Patients (N=39) with severe mental illness and co-occurring substance use disorders were evaluated. Adherence was defined as the number of self-reported medication adherent days over the past 7 days (minimum 5/7 recommended for good clinical effects). Only 8/39 (20.5%) were referred by clinicians, with the remaining 31/39 (79.5%) being self-referred. However, there were no differences in adherent days between these 2 groups. Mean days adherent were lower for women (4.13 vs. 5.63;  $p=.023$ ), patients age 30-39 vs. 50-59 years (1.0 vs. 5.0;  $p=.019$ ), and patients reporting depression vs. other diagnoses (i.e., psychotic, bipolar, and anxiety; 4.05 vs. 5.73;  $p=.012$ ), drug use in the past 30 days (4.33 vs. 5.67;  $p=.060$ ), antidepressant vs. other medication use (4.14 vs. 5.32;  $p=.049$ ), and a 2-medication regimen vs. all other regimens (i.e., 1 or 2-6 medications; 4.0 vs. 5.38;  $p=.039$ ). The results of lower adherence in women and those with less, versus more, severe psychiatric conditions diverge from previous findings in patients without co-occurring substance use disorders. Patients with more severe conditions may have been more adherent in this study because of the adherence-enhancement interventions frequently provided by the referring clinic to the most severely ill patients (e.g., intensive case management, visiting nurse services), but less often to those with depression only. The results suggest that better methods are needed for clinicians to identify non-adherent patients with co-occurring disorders and that clinicians should target adherence screening at women, younger age groups, and those with depression, recent drug use, antidepressant prescriptions, and 2-medication regimens, since their greater severity of non-adherence may make them less responsive to treatment. Supported by NIDA grants: K23-15144 (MVP) & K24-00445 (RSS).

### **A comparison of drug-use patterns and HIV/STD prevalence among female sex workers in two Mexican-U.S. border cities**

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Background/Hypothesis: Little is known about the interplay between drug use and sex work along the Mexican-U.S. border where prostitution is quasi-legal. Tijuana and Ciudad Juarez are situated on major Mexico-U.S. drug trafficking routes. The Tijuana border crossing has seen increasing methamphetamine seizures, while the Juarez crossing has more heroin seizures. As a consequence, we hypothesized that FSWs in these cities would have different patterns of drug use patterns and HIV/STD prevalence. Methods: Preliminary findings of an ongoing study of 900 female sex workers (FSWs) from two border communities, Tijuana and Ciudad Juarez, Mexico are presented. In both cities, FSWs were recruited from medical clinics and street outreach and consented to an interview and rapid HIV test. Parametric and non-parametric statistics (all  $p$ 's  $<.05$ ) were used for comparisons. Results: Compared to FSWs in Tijuana, FSWs in Juarez

were significantly older (35 vs. 28 years), less educated (5 vs. 10 years of school), and had been in the sex trade significantly longer (10 vs. 6 years) ( $p < 0.05$ ). Women in Juarez reported having significantly more clients in the last month (63 vs. 29 clients), and had a greater number of clients who were using heroin (4 vs. 0.2 clients). In addition, FSWs in Juarez were more likely to have used heroin (30% vs. 2%), cocaine (55% vs. 25%), and inhalants such as glue (19% vs. 2%) compared to FSWs in Tijuana ( $p < 0.05$ ). In contrast, FSWs in Tijuana were more likely to report using methamphetamine than those in Juarez (21% vs. 6%). Relative to FSWs in Tijuana, a greater proportion of FSWs in Juarez tested HIV+ (9% vs. 2%), and had a history of STDs (e.g., Trichomoniasis 15% vs. 0%; Vaginal Candidiasis 12% vs. 5%) ( $p < 0.05$ ). Conclusions: These preliminary results suggest that drug use and sexual risk patterns differ between these two Mexican cities, and interventions should be developed to address the unique features of each city.

### **Nicotine pretreatment increases dysphoric effects of alcohol in luteal-phase female volunteers**

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Previous reports from our laboratory showed that transdermal nicotine enhanced some of ethanol's positive effects in men without affecting ethanol's negative effects. The present report shows that some positive effects are also enhanced in women, but that several negative effects are increased in women during the luteal phase of the menstrual cycle. Twenty healthy female volunteers (10 follicular; 10 luteal), average age  $23.2 \pm 2.4$  yrs., participated in a 3-visit, placebo-controlled, randomized dosing study, investigating the effects of nicotine patch pretreatment (placebo or 21 mg) on the physiological and subjective effects of an ethanol challenge (0.4 g/kg). The study day consisted of a 3-hour nicotine pretreatment followed by an alcohol drinking period that lasted 15 minutes. Physiological measurements of heart rate, and skin temperature were made continuously for 3 hours after drinking. Measurements of subjective effects were made continuously by a customized keypad to record latency and duration of effects, and feelings of euphoria/dysphoria, and periodically through 100 mm visual analog scales (VAS) and the Addiction Research Center Inventory (ARCI). When pretreated with nicotine, luteal-phase women reported peak "stimulated" scores of 35, somewhat less than peak effects in men of approximately 50 seen in the previous study. Follicular-phase women, however, reported peak scores of only 15, about half as great as luteal-phase women. Negative effects, not seen previously in men, were increased in women. The combined drug condition produced the greatest reports of being "muddled/confused", "clumsy", and "dizzy" with peak scores of 30 to 40 in luteal-phase women. Follicular-phase women reported peak scores of 10-20, again about half as great as luteal-phase women. This study shows that luteal-phase women are more like men on the positive effects produced by nicotine-ethanol combinations. Secondly, women overall are more sensitive to the negative effects of nicotine-ethanol combinations than men, and these effects are significantly greater during the luteal phase of the menstrual cycle. Supported by NIDA Grants DA12014 and DA00343.

### **Short-duration cocaine administration induces time-dependent changes during withdrawal: An investigation of gender differences**

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We have previously shown that withdrawal from chronic cocaine induces differential effects on elevated plus maze behaviour in male and female rats. Few studies have examined the effects of short duration 'binge' type cocaine exposure on the development of anxiety during withdrawal. The current study investigated gender differences in plus maze activity during early and late withdrawal following short duration cocaine treatment. Long Evans male and female rats ( $n=40$ ) were pretreated with intermittent cocaine (0, or 40 mg/kg, i.p., daily) for 3 days. Subjects were tested on the elevated plus maze on days 1 and 7 of withdrawal. The results indicate that cocaine treatment produced anxiety in male, but not female rats, during early withdrawal. On day 1 of withdrawal, cocaine-treated male rats spent significantly lesser time in and made fewer entries to the open arms relative to controls, suggestive of anxiety. There were no differences between treatment groups in closed arm entries. Female rats showed no differences between

treatment groups on open arm time, open arm entries or close arm entries. However, cocaine-treated female rats spent more time in and made more entries to the open arms than cocaine treated male rats. On day 7 of withdrawal, the anxiogenic effects of short duration cocaine administration had dissipated in male-treated rats. However, cocaine-treated female rats spent more time in and made more entries to the open arms than saline controls. There was no difference between days 1 and 7 in both saline-treated male and female rats on measures of open arm time and entries, indicating that repeated exposure to the maze did not influence the current results. Taken together, the results suggest that short duration, high dose cocaine exposure produces opposite effects in male and female rats and that these differences are apparent during early and late withdrawal. The data advances current research on binge patterns and gender differences in withdrawal-associated anxiety.

### **Illegal drug use in Peru: Recent epidemiological estimates**

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**BACKGROUND:** The Republic of Peru recently increased its epidemiological surveillance of illegal drug use and related problems. This report presents population-level estimates based on our most recent surveillance work. **METHODS:** Data are from personal interviews conducted during a probability sample survey of community-dwelling residents, mainly age 12-64 years (sample size 4,850 persons). The estimates are based upon properly weighted survey data. **RESULTS:** Within Peru, an estimated 6.9 % of the community population has tried an illegal drug at least one time; an estimated 0.8 % had used an illegal drug in the past year. For the most part, these drugs are cannabis (estimated prevalence of recently active use, PR=0.5%) and cocaine, mainly in the hydrochloride powder form (PR=0.2 %) or in the form of coca paste (PR= 0.2%). The remainder of this report describes patterns of subgroup variation within the community population, including sex-specific, age-specific, and region-specific estimates for this country. **DISCUSSION:** The occurrence of illegal drug use in Peru's community population has not reached levels seen in the US and Canada, but there are similar epidemiological patterns (e.g., male-female ratio; excess occurrence in late adolescence and young adulthood). Of course, limitations include possible under-reporting due to fear of prosecution, as well as other widely-appreciated sources of error in this type of survey research. Nonetheless, resulting patterns of evidence are helping to guide the republic's strategy for addressing its goals for a healthy population with reduced illegal drug use. The study was developed by National Commission for Development and Life Free of Drugs (DEVIDA) with the National Institute of Statistics, and Cayetano Heredia University with funding of the United Nations Office on Drugs and Crime (ONUDD).

### **What are the odds? A hazard analysis of drug use among opioid-dependent women**

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Time in treatment, drug use spells, length of spell of drug use, drug free spells and length of drug free spell were used to conduct analyses of the likelihood of pregnant and parenting opioid dependent women changing to drug free and / or drug positive states and factors that affected the length of spells while in medication assisted treatment. Urine drug screens (5,784) collected as part of the normal course of treatment from 321 women were analyzed. Logistic regression was used to conduct a hazard analysis that indicated that for every year increase in age a woman was 2.3% ( $p < .05$ ) more likely to change from being drug positive to drug free, that women with an initial negative urine drug screen were 40% ( $p < .05$ ) more likely to change to be drug free. When the analysis was divided into pregnant and non-pregnant groups, both pregnant and non-pregnant women were found to be more likely to become drug free as their number of drug free spells increased. Logistic regression was used to conduct a hazard analysis that indicated that longer time in treatment as compared to being in treatment 30 weeks or less, decreased a woman's odds ratio for changing to drug use. When the analysis was divided into pregnant and non-pregnant groups this trend remained. Non-pregnant women who were in treatment 91 to 120 weeks were 82.6% ( $p < .01$ ) less likely to be change to a drug positive state than those women in treatment 30 weeks or less. OLS Regression was also used to determine what factors influenced the length of spells of being drug free or drug positive. Time in treatment in weeks ( $p < .05$ ), increased dose of methadone ( $p < .05$ ) and greater spells

of being drug free ( $p < .1$ ) were found to increase the length of spell of being drug free. Being benzodiazepine positive increased the length of spell of drug use by 22 weeks ( $p < .0001$ ). Being pregnant ( $p < .01$ ) decreased the length of drug use spells as did being in a greater spell of drug use ( $p < .05$ ). These results indicate the complexity of treatment for pregnant and parenting opioid dependent women and suggest that in this population the ability to maintain recovery may require two to three years of treatment.

### **Sex differences in the linkage between adolescent work experience and alcohol, tobacco, and marijuana use in an urban environment**

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**AIMS:** To examine whether adolescents who spend significant amounts of time working for pay while in high school in an urban environment are at increased risk of alcohol, tobacco, and marijuana use. **METHODS:** Data are from the Second Generation of the Johns Hopkins University Prevention Intervention Research Center (JHU PIRC) Preventive Intervention Trials. In 1993, 678 first-grade students from western Baltimore City were randomly assigned to one of two intervention trials. The youth have been followed annually and during adolescence were asked questions about their drug-using behaviors and their experiences working for pay. **RESULTS:** Of 570 participants surveyed in the 10th grade, 27% reported working for pay over the school year. Youth who worked more than 10 hours per week were more likely to report using tobacco, alcohol, and marijuana in the past 30 days compared to non-working youth and those who worked less than 10 hours per week (for tobacco, Odds Ratio (OR): 1.9, 95% Confidence Interval (CI): 1.1, 3.4; for alcohol, OR: 2.0, 95% CI: 1.2, 3.3; for marijuana, OR: 2.0, 95% CI: 1.1, 3.6). These findings, however, varied by sex. Boys who worked more than 10 hours per week were more likely to report using tobacco and alcohol in the past 30 days compared to non-working boys or boys who worked less than 10 hours per week. No work-related differences were seen in boys' marijuana using behaviors. On the other hand, no work-related differences were seen in girls past month tobacco and alcohol use, though girls who worked more than 10 hours per week were more likely to report having used marijuana in the past 30 days than non-working girls or girls who worked less than 10 hours per week. **CONCLUSIONS:** The sex differences in young workers' drug-using behaviors may be the result of different drug exposure opportunities, different reasons for working long hours, or a combination of the two. The workplace should be considered as a location for establishing drug prevention programs for adolescents. **ACKNOWLEDGEMENTS:** T32DA07292, R01DA04392 and R01DA09897.

### **Men (and women) at work: Success stories of the Job Seekers' Workshop**

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Drug abuse patients who are employed typically demonstrate better treatment outcomes than their unemployed counterparts. Despite high rates of unemployment in this population, community treatment programs often lack sufficient resources to provide ancillary vocational services. Several comprehensive vocational assistance programs for drug abusers have been described and large-scale supported work programs have been attempted (e.g., Kidorf, et al., 1998; Lamb et al., 1996). To date, however, empirical support for the efficacy of such programs is limited (e.g., Dennis et al., 1993; Hubbard et al., 1997). Such programs often require significant financial resources typically unavailable to drug treatment providers, making them expensive and often impractical for large scale implementation. An alternative, potentially more economical approach is to provide training in skills needed to find and secure a job. One such program, Job Seekers' Workshop (JSW), was developed by Sharon Hall and colleagues (Hall et al., 1977). JSW was developed specifically for drug dependent individuals and has demonstrated efficacy across several well-designed studies (Hall et al., 1981a,b; Hall et al., 1977). Despite positive findings, subsequent dissemination efforts have proven largely unsuccessful. The NIDA Clinical Trials Network (CTN) recently launched a multi-site, randomized clinical trial comparing JSW to a standard care treatment control condition (CTN0020)). This presentation reports anecdotal findings, based on practice workshops with clients. Additionally, potential factors that may have impeded previous dissemination efforts, as well as steps for improving dissemination if the CTN0020 finds JSW to be effective in "real life" settings are discussed. This research was supported by NIDA DA 13034.

## **Effectiveness of an engagement and embeddedness model to reduce HIV risk behaviors among Hispanic drug-using women**

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**Introduction:** The literature shows that women suffered from more mental health conditions, social psychological stressors, homelessness and less social support than men. However regardless of these multiple health and social needs the overwhelming drug treatment programs only address women drug use condition. This study is an effort to test a model that provides more comprehensive service program to address women HIV risk behaviors. The model was based in two theoretical concepts: engagement and embeddedness. The program comprised seven face to face interventions with multiple contacts to engage women in the program and to integrate women with social support networks and service organization systems. **Methods:** This study used the preliminary data from a five year longitudinal HIV/AIDS intervention prevention study. The sample of this paper consists of 91 women that completed the first six month follow up – 88.3% response rate (second year of the study). Data was collected through face to face interview. **Results:** More than half of the sample (54.8%) completed the seven interventions, increased their embeddedness with children (13.1% vs. 20.9%), reduce their abuse relationships (15.4% vs. 9.9%) and their mental health conditions: depression symptoms (56.0% vs. 39.6%) and anxiety symptoms (23.1% vs. 16.5%). Significant reduction was reported in homelessness (living on the streets) (32.1% vs. 15.4%) and alcohol use (66.7% decreased vs. 18.2% continued). There was some decrease in use of crack - 39.6%, but 50.9% of the sample continued using. However there was a significant change in heroin use (63.2% decreased vs. 36.8% continued) and in speedball use (50.0% decreased vs. 33.3% continued). There was not a significant reduction in HIV sexual risk behaviors: sex for money/drug or condom use. **Conclusion:** The model was effective in multiple health and drug use problems. Contrary to what expected the model was not effective in changing sexual risk behaviors. Being highly enmeshed in the sex work live seems to be a barrier to practice safe sex among these women.

## **Behavioral economic analysis of naturalistic heroin demand**

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A semi-structured interview was developed to assess behavioral economic drug demand in heroin dependent research volunteers. Information on price and purity, competing purchases, income and consumption is being obtained. Participants (n=60 so far) are low on the supply chain (85% deny any income from drug sales) and report a median price of \$10 per bag and purity of 50%. Heroin suppliers are nearby (71% < 2 miles) and reliable (88% of users only experience a failed deal < 1/mo.), enabling self-reliant transportation (81% walk, drive or take bus) with median round trip of 30 min. Heroin purchasing is motivated mainly by avoidance of withdrawal discomfort and risks of buying are discounted. Mean income is \$1599/mo., but this is an underestimate because family/friends subsidize food and housing (only 10.3% of all expenses); most income is from illegal/hidden sources (46%), employment (31%) and family/friends (13%). The disproportionate amount of income spent on heroin (77%; mean=4.6 bags/day) indicates its demand is income-inelastic. Cigarettes (5%), other drugs (4%) and personal items (4%) accounted for the balance of purchases. Parenteral vs. intranasal self-administration is associated with greater daily use (5.6 vs. 3.6 bags,  $p < .01$ ) but not greater past-month total income (\$1772 vs. \$1432) or heroin expense allocation (79% vs. 73%). Females compared to males report higher mean monthly income from illegal/hidden sources (\$1055 vs. \$578,  $p < .05$ ) family/friends (\$325 vs. \$133,  $p < .05$ ) but not total income (\$1787 vs. \$1519). These data suggest the concept of drug ‘price’ can be expanded to include factors such as drug purity, time/transportation costs, and dealer reliability, in addition to the unit (bag) price of heroin. (Supported by NIH/NIDA R01 DA15462 and Joseph Young, Sr. Funds from the State of Michigan.)

## **Gender and the substance abuse treatment workforce: Implications for the field**

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According to several regional and national workforce study surveys and additional studies with substance abuse treatment professionals (Albers, et al 2004, Campbell, et al. 2003, Gallon, et al. 2003, Mulvaney, et al. 2003, Osborn and Thombs 2002, and Storti, et al 2004) women are beginning to outnumber men as providers of substance abuse treatment services. In fact, almost two thirds of the workforce is female according to the Mountain West Addiction Technology Transfer Center (MWATTC) 2004 workforce survey data (64.5%) and the ATTC of New England 2004 workforce survey data (63%). The workforce data from these two regional studies (representing 11 states or over 20% of the country) indicates a trend may be developing. Given this, it is important that researchers, policy-makers, educators, and providers understand the significance of the data and its potential implications for the state of substance abuse treatment. For example, males represented 70% of the individuals entering treatment between 1992 and 2000 (Office of Applied Studies, SAMHSA, TEDS Data Set). This presentation will: provide an analysis of the workforce data according to gender (e.g., educational levels, recovery status, age, experience, retirement plans, salary, etc.) and highlight the potential implications of this trend (e.g., educational and training needs, recruitment strategies, treatment service delivery).

**Early findings - Colorado Women's Prison Project: Comparing substance abuse (SA) behaviors, behavioral histories, service needs/utilization of 2 age cohorts with SA problems**

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CO-WPP is a 5-year NIDA sponsored study whose purpose is to compare the effectiveness of 2 prison-based SA treatment models for female offenders, a Therapeutic Community and an Intensive Outpatient Program. Prelim. data is based on an initial cohort of 378 admitted to the Denver Women's Correctional Facility (DWCF) between Feb. 2002 and Aug. 2004. Little is known about treatment. for the female offender population in our prisons and even less is known about the profiles and needs of the aging female offender. In this poster, we compare the demographic profiles, SA, crim. justice involvement., and other risk beh. histories prior to the present incarceration of Young (less than age 40), n=286, 76%, and Mature (age 40+), n=92, 24%, female offenders recommended for intensive SA treatment. during their present incarceration term. We further identify the 2 age cohorts' self-reported service needs 6 mo. prior to the present incarceration and subsequent service utilization while in prison. The total female offender cohort is predominantly Caucasian, undereducated, and unmarried; more than 1/3 had been unemployed in the year prior to their current arrest; the median age is 35. The women in the study have an extensive LT arrest history. Over of them are parents, with an average of 3 children. While none of the services offered are age-specific, the 2 age cohorts utilized the services offered at DWCF at similar proportions. The profiles and beh. histories of the 2 age cohorts will be examined to identify and suggest more age-appropriate services for incarcerated female offenders.

**The hypothalamic-pituitary-adrenal axis is activated during postnatal withdrawal from prenatal opiate exposure**

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Withdrawal from chronic opiate treatment in mature and young rats is accompanied by increases in stress hormones. However, it has not been established that infant rats undergoing withdrawal from prenatal opiate exposure also experience HPA axis activation. Herein we show that rat pups undergoing spontaneous and antagonist-precipitated withdrawal from prenatal exposure to the long-acting opiate l-alpha-acetylmethadol (LAAM) had elevated corticosterone concentrations. Female Sprague-Dawley rats were administered 1.0 mg/kg/day LAAM or water via daily oral gavage for 28 days. Treatment continued throughout breeding and pregnancy, with no evidence of LAAM toxicity. On postnatal D1 (PND1) pups from LAAM treated and half of the water-treated dams were fostered to lactating, untreated dams. Remaining prenatal-water treated pups were reared by their biological mothers. On PND2 using a within litter design, otherwise untreated pups and pups injected with saline or 1 mg/kg naloxone HCl (sc) 30 min prior were rapidly decapitated. Plasma corticosterone was measured by radioimmunoassay. ANOVA revealed no difference

between males and females or between untreated and saline-treated pups. Prenatal LAAM-exposed pups undergoing spontaneous withdrawal postnatally had a 3-fold elevation in corticosterone (84.68 ng/ml) compared to like-treated prenatal water-exposed pups reared by biological (27.15 ng/ml) or foster mothers (25.47 ng/ml) ( $p < 0.005$ ). Following naloxone, prenatal water-treated pups showed no evidence of HPA axis activation (24.16 and 28.48 ng/ml for pups reared by biological or foster mothers). In contrast, prenatal LAAM exposed pups undergoing precipitated withdrawal had a 5.5-fold increase in corticosterone (145.37 ng/ml) ( $p < 0.0001$ ). These data indicate that rat pups exposed to opiates prenatally undergo HPA axis activation as they withdraw. Since neonatal stress can affect development, postnatal withdrawal-induced HPA activation may be a mechanism for some effects attributed to prenatal opiate exposure.

### **Reasons for drinking in pregnant smokers and non-smokers**

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Women who drink alcohol often also smoke and vice versa (Drobes, 2002). For pregnant women, such comorbidities can have serious consequences to both mother and baby. Recent findings from our lab confirm the relationship between heavy/problem drinking and tobacco use during the prenatal period (Svikis et al., 2005). The present study examined reasons for alcohol use in pregnant smokers and nonsmokers. Participants were 400 women receiving prenatal care at an urban, hospital-based, prenatal care clinic. Recruitment occurred at first prenatal visit and all participants provided informed consent. From the test battery, the current study examined the 25-item Reasons for Drinking questionnaire (Cronin, 1997) and PAL health behaviors assessment. Women were categorized as prenatal smokers ( $N=163$ ) or non-smokers ( $N=237$ ) based on self-report tobacco use data for the 3 months preceding first prenatal visit. Group comparisons were made using chi-square analyses. Women who smoked during the prenatal period endorsed 11 of the 25 reasons for drinking more frequently than did non-smoking women. Specifically, twice as many women who smoked stated that alcohol made it easier for them to express their feelings (21.8%) than nonsmokers (12.3%;  $p < .02$ ). Smokers were also nearly twice as likely to report engaging in alcohol use because: drinking helped cheer them up (21.1% vs. 12.8%,  $p < .03$ ); people they knew drank alcohol (17.6% and 8.9%;  $p < .02$ ); they felt powerful when they drank (as if they could influence others) (11.9% and 5.1%,  $p < .02$ ); alcohol made them think more about sex (23.1% and 10.3%;  $p < .001$ ) and alcohol made them feel high (22.4% and 10.7%;  $p < .002$ ). They also reported drinking because alcohol let them celebrate, to a greater degree than nonsmoking pregnant women (23.1 and 12.8%;  $p < .013$ ). Other data from our lab found pregnant smokers were at greater risk for alcohol problems than pregnant nonsmokers (Svikis et al., 2005). Current study findings provide further support for the importance of subgrouping pregnant women into smokers and nonsmokers. The data highlight clearly that women who smoke prenatally, also drink for a variety of reasons and these reasons are less frequently reported among nonsmoking pregnant women. Study findings can be used to guide the development of screening, education and intervention efforts for this high-risk population This research was supported by NIDA DA 11476 NIAAA AA 11802 .

### **Retrospective examination of the relationship between maternal methadone dose and neonatal abstinence syndrome**

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Background: Research has indicated the clinical effectiveness of providing methadone to pregnant, opioid-dependent women, but the proper dosage remains controversial. Ideal dosing of methadone in pregnancy would minimize both illicit opioid use and the severity of neonatal abstinence syndrome (NAS). Clinical research into the relationship between maternal methadone dose and NAS has produced equivocal results and is becoming outdated due to increases in maternal methadone doses. We sought to examine the relationship of maternal methadone dose with maternal opioid use and NAS severity. Methods: We studied 142 consecutive neonates born to methadone maintained mothers at San Francisco General Hospital from 1995-2004 using electronic neonatologist progress notes and chart review. The primary predictor was maternal methadone dose (low = 10-55mg, medium = 60-110, and high = 120+); the outcome was length (days) of neonate treatment with dilute tincture of opium for NAS symptoms. Results: Illicit opioid use by urine toxicology was less frequent with increasing methadone dose (low dose = 38%, medium = 20%, high = 9%,  $p = 0.012$ ), but length of treatment was significantly longer (low dose = 13 days, medium = 26 days,

high = 28 days,  $p < .001$ ). Differences in length of neonate treatment remained large and statistically significant after adjusting for maternal age, race, infant gender, gestational age and birthweight, and year of treatment (low dose = reference, medium = 14.1 extra days, high = 20.9 extra days,  $p < .001$ ). Conclusions: Higher maternal methadone doses, which are more effective at controlling illicit opioid use, appear to be associated with increased severity of NAS.

**Prenatal cocaine exposure alters the monoamine system in a gender-specific manner:  
Adrenergic receptors and norepinephrine transporter**

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Prenatal cocaine exposure has been shown to increase sensitivity to the behavioral effects of the 2 adrenergic antagonist idazoxan, specifically to attention impairment (Bayer et al., 2002). In order to test for possible changes in the adrenergic system, female Sprague-Dawley rats were surgically implanted with an intravenous access port (Mactutus et al., 1994) and allowed one week to recuperate before being paired with male rats for breeding. Upon detection of sperm with vaginal lavage, females were considered to be at gestational day 0 (GD0). Beginning on GD8, animals received saline or 3.0 mg/kg IV cocaine either 1/day or 2/day until GD21, delivered as a bolus injection. Following delivery, male and female pups were allowed to grow to adulthood before brains were removed and frozen for autoradiographic receptor binding studies. Radioligands were used to quantify levels of 1 and 2 adrenergic receptors and the norepinephrine transporter (NET) in the prelimbic region, cg1 and cg2, and hippocampus ca1 and ca2. Significant main effects of cocaine were seen in 1receptor levels in ca2. Significant main effects of cocaine were seen in 2 receptor levels in prelimbic, cg1, cg2, ca1 and ca2. Significant main effects of cocaine were seen in NET levels in cg1, and ca1. Many of these effects were modulated by significant gender differences and interactions with gender. These results might suggest the need for gender specific treatments for the attentional deficits produced by prenatal cocaine exposure. Supported by NIDA DA009160, DA013965, DA013137, DA013712, and DA014401.

**HIV risk and treatment entry among drug users in Rio de Janeiro, Brazil: Geo-behavioral analyses**

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To maximize the public health impact of drug treatment programs the risk characteristics of those seeking and entering treatment need to be examined with respect to behaviors that can transmit HIV and other blood borne and sexually transmitted diseases. New strategies for collecting and analyzing data provide an opportunity to expand our understanding of factors that are associated with the ability of treatment programs to engage those drug users at highest risk. The study uses the Audio Computer Self Interview to collect data and the Geographic Information System software to analyze spatial data of drug users seeking treatment at an outpatient treatment program in Rio de Janeiro, Brazil. In analyses of data collected we examined recent sexual risk among individuals who made initial contact with the program and those who were successfully engaged in treatment. The sample of 736 drug users had an average age of 36 (SD=10) ranging from 18-93, 84.9% were male, 48.5% white, 51.9% catholic, 52.6% had no spouse or mate, and 52.6% had less than a seventh grade education. We examined the geographic distribution of home addresses, risk behaviors, drug use frequency, and demographic characteristics. Most of illegal drugs were significantly associated with commercial sex ( $p < .001$ ), multiple partners ( $p < .05$ ) and MSM ( $p < .05$ ). Successful engagement in treatment was related to lower rates of drug use and risk behavior ( $p < .01$ ). Women were more likely to engage in treatment ( $p < .03$ ). Contrary to our hypothesis, successful program entry was inversely related to distance between the patients' home and the treatment program ( $p < .01$ ). The findings that those who were more risky were less likely to become engaged in treatment point to the need for improving strategies to facilitate either treatment program entry or community outreach



## **Chronic exercise decreases sensitivity to mu opioids in female rats: Correlation with exercise output**

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Aerobic exercise stimulates the release of endogenous opioid peptides and increases nociceptive (i.e., pain) thresholds in human and animal subjects. During chronic exercise, sensitivity to the antinociceptive effects of morphine and other mu opioids decreases, leading some investigators to propose that exercise may lead to the development of cross tolerance to exogenously administered opioid agonists. The purpose of the present study was to examine the effects of chronic exercise on sensitivity to mu opioids, and to determine if changes in opioid sensitivity during chronic exercise are correlated with exercise output. Eight female rats were obtained at weaning and housed in standard laboratory cages that did not permit any exercise beyond normal cage ambulation. Following 6 weeks under these conditions, opioids possessing a range of relative efficacy at the mu receptor (morphine, levorphanol, buprenorphine, butorphanol) were examined in a warm-water, tail-withdrawal procedure. Under sedentary conditions, all opioids produced dose-dependent increases in tail-withdrawal latencies and high levels of antinociception were observed for all drugs. An exercise wheel was then affixed to the interior of each cage for a period of 12 weeks. Under these conditions, rats ran an average of 7154 rev/day (7869 m/day), with a range across rats from 4501 to 10,164 rev/day (4951-11,180 m/day). Sensitivity to all four opioids decreased significantly during the exercise period, resulting in decreases in the potency and/or effectiveness of each drug. When exercise wheels were removed from the cages, sensitivity to all four opioids increased significantly and returned to that observed prior to the exercise period. For all drugs, there was a significant correlation between exercise output during the exercise period and changes in opioid sensitivity. These data indicate that chronic exercise decreases sensitivity to mu opioids in female rats, and that these decreases in sensitivity are significantly correlated with exercise output (supported by Davidson College and US Public Service Grant DA14255).

## **Drug-involved sex workers formerly placed in foster care**

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Introduction: Research indicates that children in foster care are more at risk for drug involvement and sex work in adulthood. However, literature appears to be absent on drug-involved sex workers who were formerly in foster care. Hypothesis: Drug-involved sex workers formerly placed in foster care will demonstrate earlier onset ages for drug use, and higher levels of risky sexual behaviors and childhood victimization than sex workers never placed in foster care. Procedures: Using targeted sampling techniques, 806 female, drug-involved sex workers aged 18-49 were recruited into an HIV and hepatitis prevention and intervention program. Interviews used standard instrumentation and focused on drug use, sexual behaviors, childhood trauma, exposure to violence, and physical and mental health status. Analyses: Frequencies, cross-tabulations and Pearson's chi-square and t-tests were performed to examine associations and calculate demographic data. Results: Sex workers formerly in foster care constituted 13.6% (n=110) of the entire sample (n=806). Drug use in the last 30 days was mainly alcohol (84.5%), marijuana (66.4%), and crack (64.5%), followed by powder cocaine (51.8%) and heroin (10%). The foster care subgroup demonstrated significantly earlier onset ages for alcohol (13.5 vs. 15.4), crack (21.7 vs. 25.7), marijuana (14.3 vs. 15.8), and powder cocaine (18.3 vs. 20.6). These respondents also became sexually active earlier (p=.000) and entered into sex work earlier (p=.000). Former foster care respondents reported they were either "often" or "very often" molested and/or sexually abused as children at a higher rate (p=.000) and were more likely to report their first sexual experience as nonconsensual (p=.000). Conclusions: Drug-involved female sex workers represent an extremely at risk population. Sex workers formerly in foster care appear to be even more at risk, with earlier onset ages for drug use, sexual activity, sex work, and a higher prevalence of childhood sexual victimization. The data indicate the need for heightened responsiveness concerning drug abuse prevention and sex education directed towards foster care youth.

## **Social network as a moderator of gender differences in employment among drug court participants**

**M. Staton Tindall, J.L. Duvall, C.G. Leukefeld, J.M. Webster and T.F. Garrity**

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Background: Employment is an important predictor of positive drug abuse treatment outcomes (i.e., Comerford, 1999), however men are more likely to report working at treatment intake than women (i.e., Oggins, 2001) and drug-using women report increased barriers to employment (i.e., Bride, 2001). A potential factor that may differentially influence employment among male and female substance abusing offenders is the social network. In general, social networks are important factors for employment among women because work provides opportunities for supportive relationships for women (Pugliesi, 1988; Aston & Lavery, 1993). The purpose of this study is to examine the relationship between social networks, gender, and employment among drug court participants. Method: Study participants were 500 volunteers (327 males and 173 females) from two Kentucky drug court programs. Face-to-face interviews were completed following treatment entry. This study incorporated bivariate and multivariate analyses to examine the moderating effects of social support on the relationship between gender and employment. Results: As expected, gender differences emerged with females working fewer jobs, fewer hours per job, fewer days paid from legitimate job sources, and less yearly income. In a series of hierarchical models regressing employment on gender and social network, significant interactions were observed for five separate social network/employment relationships. In each case, patterns indicated that social network and illegal employment were negatively associated for females when compared to males. Implications: These findings indicate that the influence of the social network may moderate the relationship between gender and employment among drug users, particularly with regard to differences in legal and illegal employment. By understanding the potential influence of negative social networks on illegal employment, treatment providers should target intervention services to gender-specific social relationships as a way of promoting behavior change and enhancing employment among substance abusers.

### **Gender differences in medical and non-medical use of opioids, sedatives and stimulants among heroin-dependent research volunteers**

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This ongoing study is evaluating whether there are gender-related differences in lifetime prevalence and pattern of medical and non-medical use of prescription drugs by heroin dependent research participants (n=157; 55F, 102M). Data are being obtained using a drug history questionnaire, Structured Clinical Interview for DSM-IV and Addiction Severity Index administered during psychiatric screening. Lifetime medical use (83%F, 74%M) and non-medical use (75%F, 78%M) of opioids does not significantly differ by gender, although females report greater lifetime chronic pain (18%F, 6%M;  $p < .02$ ). Negative consequences related to opioids are reported by 13% with medical use and 85% with non-medical use. Prior treatment for opioid abuse was sought by 73% with any non-medical use (including heroin and opium) compared to 3% with medical use. Codeine (87% medical use, 67% non-medical use) and methadone (55% medical use, 51% non-medical use) are reported as most often taken. Lifetime medical use of neuropsychiatric drugs is greater for females (40%F, 19%M;  $p < .005$ ) but may be secondary to gender differences in psychopathology (e.g. lifetime depression: 42%F, 14%M). Non-medical neuropsychiatric drug use is higher overall (compared to medical) but does not vary by gender (58%F, 57%M). Negative consequences related to neuropsychiatric drugs are reported by 5% with medical use and 6% with non-medical use. Valium (95%) and Xanax (56%) are reported as the neuropsychiatric drugs taken most often for non-medical purposes. Lifetime stimulant medical use (10%F, 5%M) and non-medical use (30%F, 24%M; mostly past methamphetamine, 85%) does not significantly differ by gender. Negative consequences related to stimulants are reported by 65% with any non-medical use, but were denied in association with medical use. In the general population, females are diagnosed with depression and chronic pain more often than males. These diagnoses are risk factors thought to promote the non-medical use of drugs. In our study sample, females are diagnosed with depression and chronic pain more frequently than males, but this is not correlated with a higher prevalence of non-medical use of opioids, neuropsychiatric drugs, or stimulants.

### **Adolescent drug opportunities, use, and use by peers: Does gender matter?**

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This study examined gender differences in adolescent drug involvement by exploring opportunities to use drugs, drug use, and drug use by friends. The study utilized a longitudinal sample of predominantly African American, urban youth, assessed annually from grade 7 to 10. Participants responded to questions regarding (a) opportunities to use tobacco, alcohol and marijuana, (b) use of these drugs within the past 12 months, and (c) use of these drugs by friends. The opportunity to use tobacco was consistently higher for boys than for girls, however during the 9th grade, girls closed the gap, resulting in a difference that did not reach statistical significance. Opportunities to use alcohol were similar for boys and girls during grades 7, 8, and 9, however by the 10th grade, girls were more likely than boys to have been offered alcohol (76.9% vs. 69.5%,  $p=0.050$ ). The opportunity to use marijuana did not differ for boys and girls in grades 7 or 8. Gender differences started to emerge in the 9th grade when boys were slightly more likely to have had the opportunity to use marijuana (51% vs. 43%,  $p=0.052$ ). This association reached statistical significance in the 10th grade (60.3% vs. 51.4%,  $p=0.032$ ). In the 10th grade, after controlling for drug use by friends, girls remained less likely to be offered tobacco or marijuana (odds ratio  $OR=0.7$ , 95%  $CI=0.5, 0.9$ ;  $OR=0.7$ , 95%  $CI=0.5, 0.96$ ), however gender differences for alcohol opportunity diminished. Next, when exploring the use of drugs, gender differences did not appear until the 10th grade at which time girls were less likely than boys to have used marijuana more than 1-2 times within the past 12 months (17% vs. 11%,  $p=0.047$ ). This association remained after controlling for use of marijuana by friends ( $OR=0.6$ , 95%  $CI=0.3, 0.9$ ). Finally, looking at the use of drugs by friends, gender differences emerged during the 10th grade when girls were more likely than boys to have friends who used alcohol (52.2% vs. 40.3%,  $p=0.005$ ). Attaining a better understanding of gender differences in drug use opportunities, drug use, and drug use by friends, will aid future prevention efforts aimed at youth drug involvement. Funding: NIDA F31DA016820; R01DA11796; NIMH R01MH57005.

### **Drug problems and the co-occurrence of behavioral disturbances in American youth**

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In this study, we explore the association between drug problems and empirically derived classification of youth into different disruptive behavior groups. The analysis is based on public-use data files for the 1994b-1996 National Household Survey on Drug Abuse (NHSDA), where 13,381 respondents aged 12-17 years old completed a comprehensive mental health checklist, an adapted Youth Self-Report (YSR). Rather than classifying psychopathology by predetermined scores, latent class analysis was used to identify classes of disruptive behavior using 24 items consistent with behavioral features of DSM-IV categories of Conduct Disorder (CD), Oppositional Defiant Disorder (ODD), and Attention-Deficit/Hyperactivity Disorder (ADHD). Problems with the use of tobacco, alcohol, inhalants, and marijuana were assessed via items based on diagnostic criteria for drug dependence and a question about having ever received treatment or counseling for alcohol or drug use. Three classes of disruptive behavior were identified: (1) low levels of disruptive behaviors (37%); (2) intermediate levels of behaviors common to ADHD and ODD but low levels of behavioral features aligned with CD (46%); and (3) high levels of ADHD and ODD like behaviors with intermediate CD behaviors (17%). We found an interaction of age, gender, and class of disruptive behavior. In general, drug problems increase with age and being classified into a class with higher levels of behavioral problems. Gender differences were greatest among youth in Class 3-those with the highest levels of disruptive behavior. For example, compared to 12/13 year old females with low disruptive behavior (reference), the association with drug problems among same-aged females in Class 3 was higher than that found in their male counterparts (females  $OR=28.9$ , 95%  $CI 16.2, 48.3$  and males  $OR=11.6$ , 95%  $CI 6.7, 20.0$ ). A similar pattern was seen in response to receiving alcohol or drug treatment. In conclusion, young female adolescents with high levels of disruptive behavior were at increased risk for having a drug problem. Acknowledgments: NIDA R01DA016323 & K01DA16720

### **Characteristics of cocaine users who buy and sell sex**

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Clients of sex workers are studied for their personality differences and motivation, but seldom studied for

their addictions and other psychopathology. In general they are a neglected subject for research (Weitzer, 2000). The NIDA-funded study “St. Louis’ Efforts to Reduce the Spread of AIDS” (ERSA) recruited out-of-treatment drug users to reduce the spread of HIV/AIDS and to increase access to drug abuse treatment (Cottler, Compton, Price et al., 1993; Price, Cottler, Compton et al., 1994; Cottler, Compton, Ben Abdallah et al., 1996). In the baseline sample, 61 cocaine users bought sex (100% male), 27 users sold sex (15% male), 16 users did both (94% male), and 240 did neither (75% male;  $p < .0001$ ). The Diagnostic Interview Schedule was used to measure lifetime mental disorders including antisocial personality disorder, depression, social phobia, simple phobia, panic disorder, generalized anxiety disorder and pathological gambling. The CIDI-SAM was used to measure alcohol and drug abuse and dependence. Fisher’s Exact Test was used to compare the four populations on psychopathology. Significantly more buyers and those who reported both behaviors (buying and selling) met criteria for cocaine dependence (Chi-square=8.23, Fisher’s exact  $p < .04$ ), while sellers and those who reported both behaviors met criteria less than expected. Similarly, more buyers and more of those who both sold and bought sex met criteria for antisocial personality disorder (Chi-square=23.75, Fisher’s exact  $p < .001$ ). Pathological gambling and alcohol dependence were higher among buyers and those who reported both buying and selling, than sellers and those who did neither, at the level of a trend. No other differences between the groups were significant. Drug treatment populations are likely to contain individuals involved in the sex trade, and buyers and those who buy and sell, who tend to be men, may have unique treatment needs. Research funding from NIDA (R-18 DA06163, L.B. Cottler, PI) and NIMH training grant (T-32-MH17104, L.B.Cottler, Director).

### **Co-occurring conditions in adolescents with opioid use disorders versus marijuana/alcohol use disorders**

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Background: Heroin use among adolescents has increased in the last 10 years. Little is known about the characteristics of adolescents with OUD Hypothesis: Adolescents with OUD have greater number of substance abuse, psychiatric disorders, and high HIV risk behaviors, than those with Marijuana/Alcohol Use Disorders (MAUD). Method: Adolescents with OUD (index group;  $n=20$ ) entering SUD treatment were matched with those with MAUD (comparison group;  $n=20$ ) by age, gender, cocaine use in the past 30 days and level of care (outpatient vs. residential). Both groups were assessed within 2 weeks of treatment entry using standardized instruments. Results: Consistent with matching strategy, preliminary results showed no significant group differences in age (17.1 vs. 16.9 yrs.), gender (20% females in both groups), level of care (75% in residential treatment for both groups), or cocaine use disorder (50% vs. 33%). However, those with OUD were more likely to be Caucasian (90% vs. 55%,  $p=.006$ ), have greater proportion of non-Opioid SUDs (38% vs. 25%,  $p=.049$ ), higher rate of sedative use disorders (35% vs. 5%,  $p=.04$ ), and earlier onset cocaine use (15.4 vs. 17.3 yrs.,  $p=.006$ ). Although the MAUD group had higher rates of marijuana use disorders (90% vs. 55%,  $p=.031$ ) their rates of alcohol use disorders were not significantly higher (60% vs. 45%). Further, only those in the index group reported any IV use (55% vs. 0%,  $p=.00$ ). There were no significant differences between those with OUD and MAUD in the number of psychiatric disorders (2.4 vs., 2.5 disorders), mean BDI scores (15.3 vs. 12.4), stealing (57% vs. 43%) or selling drugs in the past year (40% vs. 35%). Conclusions: Preliminary data shows that OUD compared to MAUD have more severe substance use and HIV risk behavior comorbidity suggesting that comprehensive and tailored treatments are needed for this group. However, both groups show a high prevalence of co-occurring psychiatric disorders highlighting the need for psychiatric treatment to be addressed during their substance use treatment.

### **Gender differences in cocaine relapse with high-dose naltrexone**

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OBJECTIVE: Our recent finding from a study suggested that treating cocaine and alcohol dependent patients with 150mg/day of naltrexone (NAL) significantly decreased the frequency of cocaine use in male patients compared to placebo. In women, however, NAL failed to produce a similar result. This gender difference might eventually be understood in the context of preexisting gender differences in drug abusers.

For example, women are often more likely to report psychiatric and medical complications than men. It is also possible that the dose prescribed for men may not be appropriate for women. The present study examined predictors of cocaine relapse for men and women, separately, in an outpatient addiction program. **METHODS:** This is a secondary analysis of a double-blind, placebo-controlled, 12-week clinical trial of NAL and two models of psychosocial treatments in cocaine and alcohol dependent male (n=116) and female (n=48) patients. Two binary logistic regression analyses, for men and women, were conducted to examine the relationship between cocaine relapse, measured by urine analysis, and the following predictor variables: medication treatment, medication compliance, psychosocial treatment, severity scores on alcohol, drug, and psychiatric problems. **RESULTS:** Of the 164 patients, 55 (37.7%) abstained from cocaine use during the treatment. Sixty-four men (61.5%) and 27 women (64.3%) used cocaine during the same period. At baseline, women, compared to men, scored significantly higher on the severity scales of drug (p=.019) and psychiatric (p=.028) problems. According to Wald criterion, therapy treatment (CBT) was an independent predictor of cocaine relapse for all patients (p=.074). Within female sample, medication treatment (NAL) and medication compliance significantly predicted the occurrence of cocaine relapse (p=.082 and p=.039, respectively). No predictors were found for male patients. **DISCUSSION:** NAL treatment may yield different therapeutic effects on cocaine relapse for men and women. Further research on the differences in baseline characteristics and pharmacokinetic effects of naltrexone for men and women will be helpful.

### **Time course of the modulatory effects of gonadal hormones on nociception, morphine antinociception, and reproductive indices in rats**

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The present study tested the hypothesis that the duration of gonadal hormone exposure needed to alter morphine's analgesic potency is the same as the duration of hormone exposure needed to support normal reproductive behavior and physiology. Sprague-Dawley rats (N=8/group) were gonadectomized, and 28 days later, male rats were implanted with capsules containing testosterone (T) or nothing (0). After 7, 14, or 28 days' exposure to T (or 0), rats were tested for basal nociception, morphine antinociception, and reproductive behavior. Steroid-sensitive organ weight was significantly greater in T- than 0-treated male rats at all time points, and organ weight increased with duration of T exposure. Reproductive behaviors were also significantly greater in T- than 0-treated rats at all time points, and some behaviors increased with duration of T exposure (e.g., % rats ejaculating). T treatment did not affect basal nociception on the hotplate or tail withdrawal tests; however, rats in the 7-day group that were tested for reproductive behavior first had significantly longer hotplate latencies than rats tested for nociception first. T treatment also increased morphine's antinociceptive potency on the tail withdrawal test; although not consistently dependent on the duration of T exposure, this depended on whether males were tested for reproductive behavior before nociception. Female rats that were treated with estradiol (E2) for 21-28 days showed maximal reproductive behavior and uterine weight, and were significantly less sensitive to morphine antinociception on the hotplate test than 0-treated females; in contrast, 7 days of E2 increased reproductive behavior and uterine weight but did not alter morphine's antinociceptive potency. These results demonstrate that the effects of reproductively relevant gonadal hormone manipulations on basal nociception and morphine antinociception may depend on the duration of hormone exposure (and in males, sexual experience). The results do not support the hypothesis that gonadal hormones modulate nociceptive and reproductive systems in concert.

### **Where there's smoke..... there's fire? Applications for prenatal tobacco and other drug use**

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The present study examined utility of prenatal tobacco use as a screening tool to identify pregnant women at risk for other drug use. Participants were 400 women receiving prenatal care at an urban, hospital-based, prenatal care clinic. Recruitment occurred at first prenatal visit and all participants provided informed consent. Self-report data were collected via questionnaires that included CAGE for other drug use, PAL substance use questionnaire (Svikis et al., 2001) and a variety of other measures. Women were categorized as prenatal smokers (N=163) or non-smokers (N=237) based on self-report data. The two groups were

compared using chi-square and t-test analyses. Demographically, they did not differ on age (mean 25.6 and 25.7 yrs., respectively) or race (65% African American) ( $p > .05$ ). Prenatal smokers, however, were more likely to have tried marijuana (71.5% vs. 36.8%); speed/uppers (11.3% vs. 1.8%); cocaine/crack (27.8% vs. 2.7%) and heroin/narcotics (16.7% vs. 0.9%) than nonsmokers (all  $p < .001$ ). Women who smoked prenatally initiated marijuana use nearly two years earlier (mean 15.56 yrs.) than non-tobacco users (mean 17.48 yrs.) ( $p < .001$ ) and were nearly 3 times more likely to report prenatal marijuana use (22.6%) than nonsmokers (8.6%) ( $p < .01$ ). All 4 Drug CAGE items (felt need to cut down, annoyed when others criticized drug use, felt guilty about drug use, used drugs as “eye-opener” to avoid withdrawal) were endorsed more frequently by smokers than nonsmokers ( $.001 < p < .016$ ) and smokers had higher mean drug CAGE scores (1.38) than nonsmokers (0.57) ( $p < .001$ ). Most importantly, women who smoked during pregnancy were nearly 5 times more likely to self-report drug-related problems (24.1%) than nonsmokers (5.1%) ( $p < .001$ ). Findings support clinical and economic use of “prenatal tobacco use” as a screen for prenatal use of other drugs. This research was supported by NIH Grants DA 11476 and AA 11802.

### **Influence of ultra-low doses of naltrexone on the acute enhancement of morphine antinociception and attenuation of tolerance in male and female rats of four strains**

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Although opioid agonists such as morphine exert inhibitory effects at relatively high doses, excitatory receptor-mediated effects are also apparent at lower doses. Recent studies indicate that selectively blocking the excitatory actions of opioids with ultra-low doses of opioid antagonists can enhance opioid antinociception and attenuate the development of opioid tolerance. In the present study, low doses of morphine were administered alone and in combination with ultra-low doses (0.1ng/kg-100ng/kg) of naltrexone both acutely and chronically in male and female rats of four strains that differ markedly in their sensitivity to opioid antinociception (F344> Sprague Dawley>Lewis>Long Evans) and the magnitude of sex differences (F344>Lewis>Sprague Dawley>Long Evans) in opioid sensitivity. All testing was conducted using a tail-flick procedure with baseline latencies adjusted in males and females of the four strains to be 2-4 sec. In male and female Sprague Dawley and Long Evans rats, naltrexone enhanced morphine antinociception in a dose-dependent manner and attenuated the development of morphine tolerance. In contrast, in male and female F344 and Lewis rats, various doses of naltrexone failed to enhance the acute antinociceptive effects of morphine or attenuate the development of morphine tolerance. These findings suggest that the ability of ultra-low doses of naltrexone to enhance opioid antinociception is strain specific and does not contribute to sex or strain differences in opioid sensitivity (Supported by grants DA10277, DA15273, DA17404 and DA11460).

### **Gender, adolescent substance-use disorders, and young-adult personality-disorder outcomes**

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Adolescent substance use disorders (SUDs) are associated with an increased risk for borderline and antisocial personality disorder (BPD and ASPD) in adulthood; gender influences this association. This is the largest known prospective investigation to date of adolescents with SUDs and reference adolescents who were followed into young adulthood and assessed for personality disorders. We hypothesized that gender and SUDs would interact to predict BPD and ASPD symptoms. The sample included 315 adolescents with cannabis and/or alcohol use disorders recruited from treatment sources and 180 adolescents without SUDs recruited from community sources (age 16+/-1). The SCID-II was administered when subjects were young adults (21+/-1) to collect BPD and ASPD symptoms. The SUD group reported significantly more symptoms of both BPD and ASPD than the reference group. A significant gender by SUD group interaction was found only for ASPD, but not for BPD. To further examine the role of gender, the 16 pooled symptoms from both disorders were examined by a latent class analysis (LCA). LCA is a type of latent structure analysis used to detect patterns of heterogeneity in symptom profiles. A four-class solution exhibited the best fit according to the adjusted BIC value. The Reference class (n=180) was

defined a priori as asymptomatic. The Mixed class (n=201) was characterized by BPD impulsivity and ASPD nonconformity. The ASPD class (n=84) was characterized by ASPD symptoms (79% of this class was diagnosed with ASPD) and BPD impulsivity. Finally, the BPD class (n=20) was characterized by BPD symptoms (65% diagnosed with BPD) and ASPD nonconformity. Gender distribution of the Mixed class resembled the Reference class, while the ASPD class contained significantly more males and the BPD class contained significantly more females than the Reference Class. Additional interacting influences, including physical and/or sexual abuse and childhood mental disorders reflecting psychological dysregulation, will be discussed.

### **Drug abuse prevention in Latin immigrant population in the autonomous region of Valencia (Spain)**

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The purpose of this study is to describe toxic substance consumption patterns among the Latin American immigrant population in the Autonomous Region of Valencia and establish practical and theoretical basis for prevention in this population. The sample included young Latin American immigrants, ranging in age from 16 to 35. Field observation and mapping were conducted in leisure areas in the cities of Valencia and Alicante, where the Latin American immigrant population concentrates. A total of 610 rapid assessment interviews were done; 4 focus groups with Latin American immigrants were conducted; and 8 focused interviews with professionals and experts in the field of immigration and drug abuse were also completed. A SPSS 12.0 analysis for quantitative data and a Grounded Theory based analysis of qualitative data were conducted. Latin American immigrants consider that the consumption of legal and illegal drugs in Spain is higher than in their countries of origin and perceive great tolerance for the use of substances such as tobacco and cannabis. They are surprised by the consumption of substances in public areas and consider that drug consumption among women is negative. The study participants agree that they do not have enough information about drugs or preventive measures. Increased information and police surveillance, and using the family unit as a preventive agent are perceived as important preventive measures. They consider that the family unit in Spain is dysfunctional [non cohesive] and consider of great importance the improvement in the cohesion of, and communication within, the family unit. Latin American population does not know about the preventive work that takes place in the Autonomous Region of Valencia, and therefore, facilitating access to preventive programs for this population is paramount. Supported by Conselleria de Cultura, Educació i Sport, G.V. 04B-093. Centro Superior de Investigación y Salud Pública. Conselleria de Sanitat, G.V.

### **Alcohol use to intoxication predicts poorer treatment outcomes in methadone-stabilized pregnant women**

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Introduction: The harmful effects of alcohol and drug use in pregnancy are well-established. However, the impact of comorbid alcohol use on the treatment outcomes for methadone stabilized pregnant women requires further study. Methods: Methadone stabilized patients (N=163) admitted to the Center for Addiction and Pregnancy (CAP) who were taking part in a larger behavioral study were categorized based on self report of alcohol to intoxication in the thirty days prior to treatment enrollment: those who reported using alcohol to intoxication (AI: n=36) and those who reported no alcohol use to intoxication (NAI: n=127). Groups were compared on current and lifetime drug and alcohol use, legal involvement, days in treatment, and urinalysis results. Data were derived from the Addiction Severity Index (ASI), patient records, and qualitative urine results. Results: The groups were similar on age, race and marital status. However, the AI group had less education than the NAI group. On alcohol and drug use measures, the AI group had more months of regular lifetime drinking (85 vs. 19 months) and were more likely to have been treated for alcohol problems (lifetime) compared to the NAI group (p<.05). The AI group also reported more current and lifetime cocaine use, and had more extensive histories of cigarette smoking than the NAI

group ( $p < .05$ ). The two groups also differed on legal involvement, with the AI group reporting more lifetime criminal convictions, and more time spent incarcerated than the NAI group. On treatment outcome measures, heroin use was similar between groups; however, the AI group was more likely to test positive for cocaine during treatment. The AI group also spent significantly fewer days in treatment compared to the NAI group. Conclusion: Assessing for any alcohol use to intoxication (past thirty days) among pregnant drug dependent women may help providers to identify patients at risk for early treatment dropout and cocaine relapse. Programs should routinely monitor patients for alcohol use and reinforce abstinence from both drugs and alcohol. For women who also use cocaine, providers should address the patient specific pattern of alcohol and cocaine use, as well as relapse prevention strategies.

### **A history of juvenile justice involvement is associated with higher lifetime substance abuse among female adult inmates**

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Most adults with substance abuse problems reported starting to use substances during adolescence and early use of substances is also associated with juvenile criminal behavior. Female inmates have more severe drug abuse problems that precipitate their entry into the prison system compared to male inmates. However, little is known about the relationship between drug use, criminal juvenile history, and later female adult incarceration. This study investigated the relationship between substance abuse and juvenile justice history among incarcerated female inmates. It was expected that women with a history of juvenile justice involvement would have higher rates of drug use and earlier ages of substance use initiation. 378 female prisoners completed questions about their criminal history as well as the drug abuse section of the ASI. The sample was comprised of adult ( $M = 34.5$  yrs.), Caucasian (49.2%), never been married (47.1%), incarcerated women with at least a high school or GED education (71.1%). 29.6% of the women reported a juvenile criminal history. Women with juvenile criminal histories were more likely to report regular cocaine use (59.8% vs. 46.1%;  $p < .05$ ), amphetamine use (85.6% vs. 72.9%;  $p < .005$ ), marijuana use (70.3% vs. 51.4%;  $p < .001$ ), hallucinogen use (23% vs. 9.1%;  $p < .001$ ), and inhalant use (9.1% vs. 2.8%;  $p < .005$ ) in comparison to women who were never charged with a crime as juveniles. These women also reported earlier ages of drug use initiation for alcohol and all other drugs of abuse. This research suggests that women with histories of juvenile justice involvement also have higher rates of lifetime substance abuse and highlights the need to intervene early with adolescents who are engaging in substance abuse and criminal behavior to prevent adult incarceration. This research was supported by NIDA grant K23DA15774-01.

### **Adolescent reports of childhood trauma and current implications of sexual behaviors and illicit drug use**

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Most available studies demonstrate a higher prevalence of childhood trauma (predominately physical, emotional, and sexual abuse) among illicit drug users compared to the general population (Medrano, 2002; 2003; Dube, 2003; Heffernan, et al., 2000; Kendler, et al., 2000). As drug use and other risk behaviors often are initiated during adolescence, it is important to study an adolescent sample rather than examining adults retrospectively. The present study provides an initial cross-sectional study examining self-reported drug use and risky sexual behavior, as well as risk taking behavior on the Balloon Analogue Risk Task as a function of trauma using the childhood trauma questionnaire in a sample of predominately inner-city African American adolescents ( $n = 96$ ; 50% female, aged 13-17). Results indicated that physical, emotional, and sexual abuse was correlated with a composite of risk behaviors including alcohol, cigarette, and marijuana use ( $r = .24$ ,  $p < .05$ ), as well as past year sexual activities ( $r = 0.38$ ,  $p < .001$ ). Additionally, performance on the BART was associated with physical, emotional, and sexual abuse ( $r = .26$ ,  $p < .01$ ). Finally, no gender and age differences were detected.

### **Overweight, drug involvement, and other psychosocial problems among graduating seniors from a historically black college**

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**INTRODUCTION.** Obesity is an important problem that especially affects African American and Hispanics (Flegal et al., 2002). College environments provide opportunities for interpersonal growth and contact among youth and young adults, generating both reinforcing and challenging situations. However, college environments might affect youth according to their individual characteristics (e.g., diathesis and copying resources). While overweight problems are associated with stress, substance use might be a mechanism to self-medicate distress. In this study, we probe by sex if weight problems are associated with tobacco use, problematic alcohol use, other drug use, perceived stress, and depression. Finally, we analyze if associations are independent of childhood overweight. **METHODS.** The data are from the College Wellness and Health Study, a cross-sectional survey among 403 students graduating from a Historically Black College. The statistical models estimate the risk of currently being overweight or obese, according to WHO classification, associated with each independent variable and controlling for age at assessment and childhood overweight. **RESULTS.** Female tobacco users were estimated to be more likely to have weight problems, compared to tobacco non-smoker females (OR= 3.0, 95% CI= 1.7, 5.5). Females were also more likely to be obese if they had more risk behaviors, such as tobacco use, alcohol disorders, marijuana use, depression, and stress (OR= 3.3; 95% CI= 1.7, 6.3). **COMMENT.** Females with weight problems are more likely to smoke tobacco and suffer psychosocial problems. Eating might be an unsuccessful copying mechanism. Training on copying mechanisms might be beneficial. Acknowledgments: grant P60-MD002217-01 from the U.S. National Center for Minority Health and Health Disparities, and grant 5U24-DA12390 from the National Institute on Drug Abuse.

### **Sex and age effects on cocaine-stimulated motor behavior and voluntary, oral cocaine consumption**

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Sex and age are both important determinants of drug response and addiction. The present studies sought to determine how these factors affect both acute behavioral response to experimenter-administered cocaine (locomotor activity) and voluntary, oral cocaine consumption. Male and female rats of three ages (PN 28, 42, 65) were injected with cocaine (5, 10, 25 mg/kg) i.p. at hourly intervals. Locomotor activity was determined in a photocell device and stereotyped behavior was recorded by an observer. Cocaine increased motor activity and stereotyped behavior of female rats more than males. Stereotyped behavior was lower in PN28 than PN 65 rats of both sexes following 5 and 10 mg/kg but greater than PN 65 and PN42 following the final binge dose, 25 mg/kg. Stereotypy in PN28 males was significantly greater than in PN65 males at this dose, but this was not true for females. Sex and age significantly interacted in determining the locomotor response to cocaine. PN65 females locomoted more than all other groups but adult males were not different than adolescents at any cocaine dose. Overall, cocaine-stimulated behavior decreases in adulthood in males but increases in females. Voluntary cocaine drinking was used to assess sex and age related influences on subjective cocaine effects. Male and female rats (PN 28, 42, and 65) drank significant quantities of a cocaine/saccharin solution (0.5 g/L for both) in daily 5 hr trials without water deprivation. Rats chose to drink either saccharin or saccharin/cocaine after three initial trials with the cocaine solution only. Cocaine consumption rapidly increased in male rats that began drinking on PN28 to levels that were significantly greater than those in PN65 rats. PN28 males drank more cocaine than PN28 females and no age differences were observed in female rats. Voluntary consumption did not mirror age-related patterns of cocaine-stimulated motor activity in female rats, but increased voluntary consumption in periadolescent males was similar to the enhanced cocaine-stimulated behavior at this age. Graciously supported by NIDA grant DA 09079.

### **Disturbed sleep, mental health problems, and substance abuse among women with victimization experiences**

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Research has begun to examine associations of disturbed sleep with substance abuse or dependence. Sleep

disorders or problems are complex with multiple comorbidity factors which may be purported to explain effects of disturbed sleep including mental health issues such as depression, PTSD, and anxiety. Physical and sexual violence victimization have been associated with mental disorders, health problems, and substance abuse among women. Disturbed sleep among women with victimization has received only limited attention. This study examined sleep, health and mental health problems, and substance use among a non-clinical sample of 757 women with victimization who had obtained a protective order. Sleep, health and mental health, substance abuse and victimization were examined using a questionnaire adapted from validated instruments. Respondents were categorized into three sleep groups (low, medium, high) based on Kripke, et al's (2002) study of hours of sleep and mortality risk. It was hypothesized that less reported sleep would predict greater health, mental health, and substance abuse problems. Overall, the women reported an average 5.7 hours of sleep per night. Using Logistic Regression and ANCOVA analysis controlling for age, race, and rural/urban area, there was a linear relationship between sleep and most of the health/mental health indices, substance use, and victimization. The low sleep group was significantly more likely to report lifetime and current PTSD, depression, and current anxiety ( $p < .001$ ), as well as muscle/bone complaints, GI problems, and nervous system complaints (including migraines) Further, women with less sleep were more likely to report using antidepressants and benzodiazepines ( $p < .001$ ), and were more likely to report stalking and sexual assault victimization ( $p < .01$ ). This study suggests that disturbed sleep may have multiple associations with victimization, health and mental health problems, and substance use. In fact, it may be a primary problem needing intervention rather than just a symptom of other conditions.

### **Influence of menstrual cycle phase on illicit drug use**

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Ovarian hormones have been studied in animal and human studies of substance abuse and have included a focus on menstrual cycle phase and premenstrual symptoms. Women's subjective responses have been observed to differ according to menstrual cycle phase for amphetamines, cocaine, and alcohol however; effects for opiates have not been described. The research questions explored in this study were: 1) does the likelihood of illicit drug use change as a function of menstrual cycle phase? 2) Is drug use related to severity of premenstrual symptoms? Fifty four women who were in the early part of their drug abuse treatment were asked to complete a brief survey of typical premenstrual symptoms (PMS) experienced. Survey responses were linked to urine toxicology results through their SAMIS numbers. Chi-square and t-tests were conducted as appropriate. The majority of the women (81%) were on methadone as part of their treatment program. Thirty four women (63%) reported regular menstrual cycles. Three (9%) reported symptoms consistent with premenstrual dysphoric disorder (PMDD), slightly more than the 5% estimated in the general population of women. Another 37% reported symptoms consistent with moderate PMS with the remaining 54% reporting mild or no symptoms. Of the women with regular menstrual cycles, 15 had positive urine toxicology results available for review. There was no relationship between a positive toxicology screen and menstrual cycle phase with about half (55%) with a positive screen in both the follicular and luteal phases of the menstrual cycle. There was also no relationship between number of PMS symptoms reported and having a positive screen. Both women with PMDD had negative screens. Additional study with larger samples are needed to support an increased prevalence of PMDD which if present would have implications for treatment.

### **Early sexual experiences increase the risk to initiate illegal drug use at a later age**

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Introduction: Adolescents who have started having sex at an early age (< age 13) often initiate illegal drug use at an earlier age (< age 14). However, not all sexually active teens initiate early illegal drug use. In this study, we explore the subsequent risk of initiating illegal drugs among a sample of minority college students who had not started using illegal drugs by age 14 and estimate the time to first illegal drug use as a function of early sexual experience by age 13. Methods: African American college students from 35 HBCUs completed a self-administered paper-and-pencil survey that assessed age of onset of sexual experiences and age first used tobacco, alcohol, and any illegal drugs. The vast majority of students did not use any illegal drugs before age 14 (94%,  $n=6696$ ). The main variable of interest is the age of first use of

any illegal drug. Early sexual experience was defined as the initiation of vaginal, oral, anal sex or same gender sex at or before 13 years old. Discrete-time survival analyses also controlled for gender, age, total family income, religion and use of either tobacco or alcohol. Results: Among those without early illegal drug use (e.g., not use before age 14), 15% reported early sexual experiences. A greater proportion of students initiated illegal drug use if they reported early sexual experiences (40%) as compared to those who without early sexual encounters (24%). In addition, students with early sexual experiences were more likely to initiate illegal drug use at an earlier age than those without early sexual experiences (OR:1.3, 95% CI:1.1-1.5). Comments: Our findings suggest early sexual activity is related to early onset of illegal drug use, regardless if involvement with illegal drug use happens more or less concurrently with the onset of sexual activity or not. Prevention efforts to decrease illegal drug use should not ignore the possible delayed effect of other early behaviors such as early sexual activity. Acknowledgements: NIDA 12390 and The National Historically Black Colleges and Universities Substance Use Consortium.

### **Childhood trauma among drug-involved, street-based sex workers in Miami**

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Hypothesis: Street-based sex workers have extensive histories of childhood maltreatment, which is associated with earlier lifetime drug use and sex work initiation and current homelessness and violent victimization. Procedures: 804 drug-involved women who trade sex were recruited using targeted sampling techniques in Miami, Florida as a part of a NIDA supported HIV and hepatitis intervention. Standardized instruments were used to collect data on demographics, childhood trauma, drug use and sex work histories, and current violent victimization. Analyses: Descriptive statistics were calculated using demographic data, sex and drug histories, and current victimization. Pearson's chi square and one-way ANOVA post-hoc tests were performed to examine multivariate relationships. Results: Participants were ages 18 to 53 with a median age of 38. A majority were African American (63.6%), Caucasian (18.7%), or Hispanic (15.2%), and 71.4% reported past 30-day crack use. Childhood trauma was highly prevalent among this sample. A majority reported moderate to severe emotional (60.1%) and physical neglect (74.8%). Also, many reported moderate to severe levels of emotional (48.3%), physical (36.3%), and sexual abuse (48.0%). There is a notable relationship between childhood trauma levels and ages of initiation of drug/alcohol use and sex work. Those reporting severe childhood sexual abuse began sex work at an earlier mean age (20.7 years vs. 24.0 years,  $p=.000$ ), and initiated alcohol (14.1 vs. 15.9,  $p=.000$ ), marijuana (14.8 vs. 16.0,  $p=.005$ ) and injection drug (21.8 vs. 23.4,  $p=.025$ ) use at earlier ages than those who reported no childhood sex abuse. Also briefly examined are current homelessness and adult violent victimization. Women reporting childhood abuse are more likely to be homeless (45.7% vs. 29.5%) than those who do not ( $p=.000$ ). Importance of findings: This paper recognizes that childhood maltreatment is a significant antecedent to life trauma among drug-involved, street-based sex workers. Not only do these women start drug use and sex work careers earlier, but they experience more victimization as adults than women without childhood maltreatment.

### **Drug use differences by race in women prisoners**

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In the general U.S. population, Caucasians are more likely than African-Americans to use drugs, but less likely to have persistent dependence. Information on the relationship between drug use disorders and race is complex and sometimes conflicting. In the U.S. prison population, African-Americans are over-represented. Few studies have looked at drug use by race in prison populations. The goal of this study was to determine differences by race in regular drug use and age of initiation among women prisoners. 378 female prisoners completed a demographic questionnaire as well as the drug abuse section of the ASI. The sample was comprised of adult ( $M= 34.5$  yrs), Caucasian (49.2%), incarcerated women with at least a high school or GED education (71.1%). Caucasian women were more likely to report regular use of methadone (12.5% vs. 3.7%;  $p<.005$ ), opiates (48.4% vs. 16.1%;  $p<.001$ ), barbiturates (23.3% vs. 5.6%;  $p<.001$ ) sedatives (46.1% vs. 11.3%;  $p<.001$ ), amphetamines (85.9% vs. 65.2%;  $p<.001$ ), marijuana (64.5% vs. 47.5%;  $p<.001$ ), hallucinogens (22.8% vs. 3.1%;  $p<.001$ ), and inhalants (7.7% vs. .6%;  $p<.001$ ) in comparison to African-American women. Additionally, Caucasian women reported earlier age of drug use

initiation for opiates (M= 18.09yr.vs. 20.5yr; p<.05), cocaine (M= 19.26yr.vs 22.65yr; p<.001), marijuana (M= 14yr.vs.15.07yr; p<.05), and inhalants (M= 16.70yr.vs.10.33yr; p<.05). More Caucasian women used drugs intravenously including heroin (68.3% vs. 25%; p<.001), amphetamines (26.1% vs. .0%; p<.005), and cocaine (29.5% vs. 9.1%; p<.001) and had overall higher rates of IV drug use (39.7 v. 8.8; p<.001) than African-American women. Caucasian and African-Americans are nearly equal in number in this prison population, but Caucasian women had higher rates of drug use, especially IV, and younger age of first use than African-American women. Though African-Americans are over-represented in the prison population, this is not necessarily due to drug use factors, but separate socioeconomic factors. This research was supported by NIDA grant K23DA15774-01.

### **The role of 5-HT1A and 5-HT1B in cocaine-induced locomotor activity in male and female rats**

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In this study, we aim to determine the role of 5HT1A and 5-HT1B receptors in the regulation of sex differences in cocaine-induced responses. Male and female rats were pretreated (i.p.) with WAY 100635 (a 5-HT1A antagonist; 0, 0.4, 0.8 & 1.6 mg/kg; 15 min pretreatment), GR 129735 (a 5-HT1B receptor antagonist; 0, 5, 10, 15 mg/kg; 30 min pretreatment), or vehicle (saline; two separate control groups were run for each antagonist). Thereafter, rats received ip. injections of saline or cocaine (20mg/kg). Overall, cocaine increased rearing, ambulatory and total locomotor activity in both males and females. Consistent with previous reports, female rats demonstrated higher counts in all three behaviors than male rats. Neither WAY 100635 nor GR 129735 altered baseline behavior in any of the behavioral measurements. Regardless of the dose, cocaine-induced total locomotor activity was decreased after WAY 100635 administration. In males, 0.4 & 1.6 mg/kg of WAY 100635 decreased ambulatory activity while in female rats all three doses tested lowered cocaine-induced ambulatory activity. Moreover, in male rats, all three doses of WAY 100635 decreased rearing activity, while in females rearing was only decreased at the 0.4 mg/kg dose. In both males and females, 10 & 15 mg/kg of GR129735 decreased ambulatory and total locomotor activation. However, while in male rats 10 & 15 mg/kg of GR129735 decreased rearing activity, in females only the 15-mg/kg dose was effective. Taken together, we demonstrated that in both male and female rats, the activation of both serotonin receptor subtypes modulate cocaine-induced behavioral effects. In addition, the efficacy of the antagonist differs based on behavioral responses and sex. Thus, these findings suggest intrinsic sex differences exist in the regulation of 5HT1A and 5-HT1B receptors on cocaine-induced responses. Finally, our results suggest that the serotonergic system may contribute to the known sexual dimorphic responses to cocaine. This work was supported by 506-GM60654 and SNRP NF-39534.

### **Differences in women methamphetamine and cocaine users seeking residential Treatment: characteristics and predictors of premature discharge**

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The use of methamphetamine (MA) is a rising public health problem in the southern US. Currently, use among women now equals, and in some cases, exceeds that among men. Cocaine (COC) continues to be a predominant drug of abuse among women presenting for substance abuse treatment. Previous studies have examined differences in methamphetamine and cocaine users, characteristics of the users, and consequences of use, but primarily in a male outpatient population. This paper looks retrospectively at a cohort of women presenting for residential treatment at a women's only treatment facility September, 2002 to August, 2003 (n = 612; MA = 122; COC = 490). In our cohort, the methamphetamine users were actually younger, Caucasian, less likely to have been incarcerated, had fewer prior treatments, to administer the drug intravenously, and to have had more health consequences of use than those women using cocaine. Predictors of premature discharge were determined by logistic regression. For both methamphetamine and cocaine users, older patients and those with CPS involvement were less likely to leave treatment prematurely. Hispanic and Caucasian patients were also shown to be less likely to leave treatment

prematurely. Drug of choice, prior treatments, and legal status were not shown to be adequate predictors of premature discharge in our particular cohort.

### **In vitro and in vivo effects of cocaine on the fetal-placental endocrine axis in humans**

**A.D. Williams, B. Ahluwalia, L. Kaul and W. Pei**

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Human and animal studies reported that long term use of cocaine during pregnancy caused premature births, low birth weight newborn, abruptio placenta and host of other pregnancy disorders. We postulated that cocaine affects fetal-placental endocrine axis. The studies were conducted in vitro and in vivo. For in vitro study, placenta was obtained from subjects who were drug free (licit or illicit) throughout pregnancy (control). For in vivo study, fetal membranes were isolated from the placenta and amniotic fluid was aspirated at the time of birth in subjects who used cocaine on a regular basis throughout pregnancy. To determine whether cocaine affects progesterone synthesis, cytotrophoblasts cells were isolated from placenta immediately following delivery and incubated in media containing 30 $\mu$ M cocaine along with either substrate (25-hydroxy cholesterol or low density lipoprotein (in vitro study). To determine whether cocaine affects prostaglandins synthesis PGs (E2 and F2 $\alpha$ ) levels were measured in fetal membranes and in amniotic fluid using radioimmunoassay (in vivo study). The results of this study show that 1) progesterone synthesis in cytotrophoblast cells decreased significantly ( $p < 0.01$ ) in the presence of cocaine and 2), PGE2 and PGF2 $\alpha$  levels were significantly increased in fetal membranes and in the amniotic fluid in cocaine users. ( $p < 0.01$ ). To determine whether cocaine effects cAMP levels in cytotrophoblast cells, cAMP levels were measured in cytotrophoblast cells in the presence of cocaine (in vitro study) and the data show that cAMP levels decreased significantly ( $p > 0.01$ ). We conclude that cocaine initiates a cascade of biochemical changes leading to decrease progesterone synthesis, an increased prostaglandins synthesis causing premature births and increase incidence of abruptio placenta in cocaine users in humans.

### **Correlation between neuropsychological deficits and indices of vascular resistance to flow in cocaine abusers: Gender differences**

**N.M. Wilson, K. Tate, W. Better, K. Bolla, R. Herning and J.L. Cadet**

*NIH/NIDA Intramural Research Program and Johns Hopkins School of Medicine, Baltimore, MD*

Neurobehavioral and cerebrovascular impairments are very well documented in population of drug abusers. Nevertheless, interactions between cerebrovascular and performance on neurocognitive tasks have not been addressed in these patients. Thus, the purpose of this study was to investigate possible relationships between neuropsychological deficits and blood flow abnormalities measured by Transcranial Doppler (TCD) sonography. The study consisted of 45 outpatient controls and 109 cocaine users. Because 10 of the cocaine subjects and 20 of the controls were females, we were able to investigate gender influenced results. Regression analyses indicated that cocaine users demonstrated impairments on specific neurocognitive tasks. These deficits correlated with indices of vasoconstriction measured by TCD. Interestingly, there were greater significant correlations between TCD and neuropsychological performance among the women when compared to men. These findings support previous research that suggests the existence of gender differences in cerebral blood flow and neurocognitive performance in cocaine abusers.

### **A comparison of buprenorphine/naloxone adolescent opiate subjects and the drug evaluation network study**

**G.E. Woody**

*University of Pennsylvania, Philadelphia, PA and Treatment Research Institute, Philadelphia, PA*

**Introduction & Methods:** The Buprenorphine/Naloxone Adolescent Opiate study evaluated the efficacy of buprenorphine/naloxone in short-term treatment of opioid dependent patients aged 14-21. The Drug Evaluation Network Study (DENS) evaluated opioid dependent patients upon entry into treatment programs across nationally using the ASI. We intend to compare the basic demographics, including substance use histories for both groups, to determine if the CTN group sample is relational to the national adolescents data collected. In this evaluation, we compared baseline demographic data on 62 patients from the buprenorphine/naloxone study with similar data on 170 patients aged 18-21 who used opioids >14 days

in the last 30 and were evaluated by DENS over a similar period of time. Results: Drug use for the buprenorphine/naloxone patients in the last 30 days was: heroin 94%; methadone 10%; other opioids 34%. Comparable data for DENS were: heroin 56%; methadone 12%; other opioids 29%. Use of more than one opioid was common in both groups. Average age of those using specific drugs for buprenorphine/naloxone patients was: heroin 18.7; methadone 18.8; other opioids 19. Comparable data for DENS were: heroin 20; methadone 24; other opioids 20.2. Gender and primary drug use in the buprenorphine/naloxone study were: heroin, 65% male/35% female; methadone 33% male/67% female; other opioids 71% male/29% female. Similar data for DENS were: heroin 50% male/female; methadone 55% male/45% female; other opioids 63% male/37% female. For ethnicity, 66-71% of patients in the buprenorphine/naloxone study were Caucasian and none were African American; for DENS 74-90% of patients were Caucasian and 8% or less were African American. Mean days of opioid use in the buprenorphine/naloxone study were: heroin 28; illicit methadone 3.2; other opioids 11.5. Similar data for DENS were: heroin 26; illicit and licit methadone 26.2; other opioids 21.4. Mean years of opioid use for the buprenorphine/naloxone study were: heroin 2.19; methadone 1.3; other opioids 1.67. Similar data for DENS were; heroin 2.43; methadone 1.2; other opioids 2.64. Conclusions: Drug use patterns were similar except for more heroin use in buprenorphine/naloxone patients than in DENS; more heroin use among males than females in the buprenorphine/naloxone study but not in DENS; and a very low percentage of African-American patients in both samples. Use of "other opioids" (primarily prescription opioids) was common, as was use of more than one opioid in both groups of these young opioid dependent patients. These data suggest that the buprenorphine/naloxone study sample is representative of treatment patients across the county.

### **The effect of methadone, buprenorphine and levo-a-acetylmethadol on human placental aromatase**

**O.L. Zharikova, S.V. Deshmukh, T.N. Nanovskaya, I.A. Nekhayeva, G.D.V. Hankins and M.S. Ahmed**

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Aromatase (CYP19) is a key enzyme in the synthesis of estrogens in human placenta. Recent data from our laboratory identified aromatase as the major enzyme responsible for the metabolism of methadone, BUP and LAAM to EDDP, norBUP and norLAAM, respectively. In addition, placental tissue retains the three opiates thus forming a concentration gradient with the maternal circulation. Methadone and BUP are used in treatment of the pregnant opiate addict thus raising a question on their effects on aromatase activity in the conversion of testosterone and 16 $\alpha$ -hydroxytestosterone to 17 $\beta$ -estradiol and estriol, respectively. Microsomal fractions from term placentas were utilized and HPLC/UV was used to determine the products formed. Opiates Estradiol formation Ki ( $\mu$ M) Estriol formation Ki ( $\mu$ M) Methadone 393 $\pm$ 144 53 $\pm$ 28 EDDP >2000 161 $\pm$ 36 BUP 36 $\pm$ 9 6 $\pm$ 1 NorBUP 131 $\pm$ 39 56 $\pm$ 13 LAAM 381 $\pm$ 17 12 $\pm$ 8 NorLAAM 408 $\pm$ 80 167 $\pm$ 59 DinorLAAM 178 $\pm$ 33 72 $\pm$ 12 Data analysis revealed that the opiates and their metabolites are competitive inhibitors of both substrates with the Ki values cited in the table. It appears that the parent opiates are more potent inhibitors than their metabolites and all compounds decreased the formation of estriol more than that of estradiol. These data is in agreement with clinical reports on the lower levels of estriol in pregnant women enrolled in methadone treatment programs. Supported by a grant from NIDA to M.S.A.

### **Effects of progesterone and estrogen antagonists on cocaine-induced behavioral psychomotor responses**

**H.B.K. Wu, T. Niyomchai, K. Weierstall, A.C.E. Minerly, D. Hunter, J. Weiner, W. Sun, L. Zhou, S. Jenab and V. Quinones-Jenab**

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A plethora of evidence suggests that sex differences in response to cocaine administration may be regulated by endogenous gonadal hormones. However, the mechanisms by which gonadal hormones alter cocaine-induced behavioral responses have yet to be determined. In this study, we hypothesize that in both male and female rats activation of progesterone and estrogen intracellular receptors are part of the cascade of events necessary for the interaction between these steroids and cocaine. To this end, rats were pretreated for one hour with either RU486 (progesterone antagonist; 0, 3, 25 mg/kg; dissolved in DMSO; i.p.), tamoxifen (estrogen antagonist; 0, 1, or 3 mg/kg; dissolved in sesame oil; s.c.) or vehicles, followed by saline or

cocaine (15 mg/kg; i.p.) treatment. Overall, cocaine increased ambulatory and rearing behaviors. Moreover, as previously demonstrated by our group and others, sex differences were observed in rearing activity; cocaine-treated female rats had higher rearing counts than cocaine-treated male rats. Intrinsic sex differences were found in RU 486 efficacy; in male rats 3 mg/kg of RU 486 significantly attenuated, while in female rats increased cocaine-induced ambulatory and rearing activities. In female rats, no effect of tamoxifen was observed, while in male rats the 1 mg/kg dose of tamoxifen inhibited ambulatory responses to cocaine. Taken together, our results suggest that in both male and female rats activation of the progesterone receptor is needed to mediate some behavioral responses to cocaine. Since intrinsic sex differences exist in the efficacy of RU 486, it is possible that progesterone receptor levels and/or rate of activation may differ between the two sexes. Finally, estrogen receptor activation may in part regulate behavioral activation in male rats. It is feasible that in female rats, due to the high levels of endogenous estrogen, higher doses of tamoxifen may be needed to block cocaine-induced behavioral responses. This research is supported by 506-GM 60654 and NF39534.

**Substance use and other risk factors related to interpersonal violence towards latina immigrants: Recommendations to improve treatment programs for perpetrators**

**M.J. Zarza**

*Behavioral Assessment Inc. Santa Monica, CA, and El Centro-Catholic Charities, Trenton, NJ*

Recent studies on Male Towards Female Intimate Partner Violence (MFIPV) among Latinos reveal that alcohol, child abuse, impulsivity and poverty are significant factors to explain MFIPV. Intervention programs for Latino perpetrators in New Jersey are scarce and based on healing trauma and anger management components that are originally designed for other groups. Methods: 74 Latina immigrants victims of MFIPV participated in this cross-sectional study. Variables and measurements were structured in: 1) Demographic factors, 2) Substance use, 3) Type and severity of MFIPV, 4) Perpetrator's lack of control; and 5) History of abuse in childhood. Procedure: The NJ Department of Community Affairs facilitated contact with Hispanic CBOs and victims organizations. Participants completed the questionnaires individually. Victims under imminent risk or living in shelters were excluded from the study. Descriptive, frequency, and bivariate correlation analysis were conducted. In addition, a linear regression analysis was performed for three dependent variables (emotional, physical and sexual abuse) and the independent variables of alcohol use, child abuse and lack of control in perpetrators. Results are consistent with other studies. Most perpetrators (73%) use alcohol weekly and 32% use other drugs. Frequent use of alcohol is positively related to the use of marijuana and cocaine. Most perpetrators (93%) have a history of violence in their childhood and 72.2% loose control often. These variables show significant positive associations to MFIPV. Results on the regression analysis show how the use of alcohol and the lack of control are the most important variables to explain MFIPV. Perpetrator's experienced abuse in childhood, although related to their violent behavior, seems to be less powerful to predict physical and sexual abuse. Conclusions stress the importance of considering substance use, impulsivity and history of violence when designing MFIPV intervention programs with Latinos. Education on intergenerational transmission of violence is also an important element when working with Latino perpetrators of MFIPV.

**Predictors of outcome in the NIDA Clinical Trials Network randomized, multicenter trial of buprenorphine-naloxone versus clonidine for short-term medically supervised withdrawal**

**D. Ziedonis, L. Amass, M. Steinberg, G. Woody, J. Krejci and W. Ling**

*Robert Wood Johnson Medical School, Piscataway, NJ, University of Pennsylvania, Philadelphia, PA, Friends Research Institute, and University of California, Los Angeles, CA*

The need for opioid medical withdrawal treatment is common, and yet there have been few studies in community settings evaluating pharmacotherapies for this issue and little is known regarding predictors of outcome. This paper reports on predictors, mediators and moderators of treatment completion, attendance and opioid abstinence among 344 opioid dependent men and women who were prospectively randomized to receive either buprenorphine/naloxone or clonidine as part of a NIDA Clinical Trials Network open-label 13-day study of medically-supervised withdrawal in community inpatient or outpatient settings. These data support a mediational model whereby medication type has its effect on treatment response, at least partly, through its effects on opioid withdrawal. Buprenorphine-naloxone's ability to relieve early withdrawal

symptoms was an important predictor of greater attendance, ( $B=.094$ ,  $SE\ B = .038$ ,  $= -.120$ ,  $p = .016$ ), greater treatment completion, ( $OR = .893$ ,  $95\% \text{ CI: } .827 - .964$ ,  $p = .004$ ), and greater perfect attendance ( $OR = .896$ ,  $95\% \text{ CI } .830 - .967$ ,  $p = .005$ ), contributing to the improved outcomes seen in patients receiving buprenorphine-naloxone relative to clonidine. Inpatient subjects with lower withdrawal scores at baseline did better than those with higher withdrawal scores when receiving clonidine. Inpatient subjects with higher withdrawal scores at baseline did better than those with lower withdrawal scores when receiving buprenorphine,  $F(3,309) = 17.03$ ,  $p < .001$ ). Withdrawal score severity was not a predictor in the outpatient setting. No relationship was detected between treatment success and age, education, history of imprisonment, being on probation, gender, duration of drug use, education, employment, or marital status. This study suggests that early withdrawal severity mediated the relationship between medication type and performance during inpatient but not outpatient treatment. Other predictive factors will be presented.

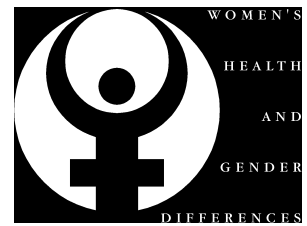
### **Complicated grief treatment for persons with substance use disorders: A pilot study**

**A. Zuckoff, E. Frank, D. Daley, J. Cornelius, K. Seligman, R. Silowash and K. Shear**

*University of Pittsburgh School of Medicine, Pittsburgh, PA*

Empirically supported treatments for co-occurring complicated grief and substance use disorders are lacking. We conducted an open prospective pilot study of an outpatient, 24-session individual Complicated Grief and Substance Use Treatment. This manual-guided psychotherapy integrates motivational interviewing, emotion management, and communication skills into our treatment for complicated grief. We hypothesized that at post-treatment, participants would display significant reductions in grief, substance use, and depression symptoms as compared with their pretreatment condition. 9 women and 7 men who were bereaved  $\geq 6$  months, scored  $\geq 30$  on the Inventory of Complicated Grief (ICG), and met DSM-IV criteria for a substance use disorder (previous 6 months) were assessed and attended at least 1 therapy session. Participants were 42.3 years old ( $SD=9.8$ ,  $\text{range}=25-57$ ), 50% Black / 44% White. 7 were grieving violent and 9 were grieving nonviolent deaths. Mean time since the death was 9.8 years ( $SD=9.7$ ,  $\text{range}=0.7-31.7$  years). A higher proportion of women than men (67% vs. 29%) and those grieving violent vs. nonviolent deaths (71% vs. 33%) did not complete the treatment. At post-treatment, mean ICG reductions were 30.9 ( $SD=15.4$ ,  $p=0.008$ ) for completers and 15.3 ( $SD=19.7$ ,  $p=0.011$ ) in the intent-to-treat analysis (IT), with effect sizes (Cohen's  $d$ ) of 2.01 and 0.78. Mean BDI reductions were 15.5 ( $SD=5.5$ ,  $p=0.008$ ) for completers and 7.9 ( $SD=10.0$ ,  $p=0.009$ ) in IT, with effect sizes of 2.82 and 0.79. Timeline Followback Percent Days Abstinent increased 26.5 in completers ( $SD=29.8$ ,  $p=0.039$ ) and 20.4 in IT ( $SD=43.4$ ,  $p=0.044$ ), with effect sizes of 0.89 and 0.47. Grief and depression outcomes were comparable to those obtained in a pilot study with patients without substance use disorders (Shear et al, 2001). Complicated Grief and Substance Use Treatment is a promising intervention that merits testing in a controlled trial. Supported by NIMH grants R01 MH60783-01A1 and 5P30 MH030915-28, and NIDA supplement MH60783-02.





## 2006 College on Problems of Drug Dependence Women & Gender Junior Investigator Travel Awards

There is accumulating evidence that the antecedents, consequences, and mechanisms of drug abuse and dependence are not identical in males and females and that sex/gender may be an important variable in treatment and prevention outcomes. To foster research on women and sex/gender differences in all areas of drug abuse research, both human and animal, the National Institute on Drug Abuse encourages the submission of abstracts on this topic for the 2004 annual meeting of the College on Problems of Drug Dependence (CPDD).

Special NIDA travel awards of up to \$750 will be available to 30 junior investigators whose CPDD abstract on women or sex/gender differences is accepted for either a poster or oral session at the 2006 annual meeting in Scottsdale, AZ, June 17-22.

### ELIGIBILITY:

- Graduate and medical students, post-doctoral students, medical residents, and investigators who are no more than five years past the doctoral degree or residency are eligible.
- Applicant must be first author on the CPDD abstract.
- Minority investigators and male investigators are especially encouraged to apply.
- Federal employees are ineligible.
- Priority may be given to those who have not previously received this award or held an R01.

### APPLICATION PROCEDURES:

- Follow the CPDD instructions for abstract submission. Then mail a copy of the **full abstract form** that you submitted to CPDD to:  
Dr. Cora Lee Wetherington  
National Institute on Drug Abuse  
6001 Executive Boulevard, Room 4282, MSC 9555  
Bethesda, MD 20892-9555 (For overnight mail: Rockville, MD 20852)
- Include your curriculum vitae.
- Include a cover letter indicating (1) your eligibility, (2) your career goals, and (3) your interest in pursuing research on women and/or sex/gender differences.
- Please do not fold your application materials.
- Applications for this award must be postmarked by **January 17, 2006**.

For additional information about this annual award, contact:

Dr. Cora Lee Wetherington at telephone 301-435-1319 or at [wetherington@nih.gov](mailto:wetherington@nih.gov)



## Women and Sex/Gender Differences Program Announcements

- **PA-03-139: WOMEN, GENDER DIFFERENCES AND DRUG ABUSE**  
<http://grants1.nih.gov/grants/guide/pa-files/PA-03-139.html>
  
- **PA-05-083: DRUG ABUSE DISSERTATION RESEARCH: EPIDEMIOLOGY, PREVENTION, TREATMENT, SERVICES, AND WOMEN AND SEX/GENDER DIFFERENCES**  
<http://grants1.nih.gov/grants/guide/pa-files/PA-02-055.html>
  
- **PA-04-153: HEALTH DISPARITIES AMONG MINORITY AND UNDERSERVED WOMEN.**  
<http://grants.nih.gov/grants/guide/pa-files/PA-04-153.html>
  
- **PA-04-126. SUPPLEMENTS TO PROMOTE REENTRY INTO BIOMEDICAL AND BEHAVIORAL RESEARCH CAREERS**  
<http://grants.nih.gov/grants/guide/pa-files/PA-04-126.html>  
(Note: Subject matter of these supplements does not have to pertain to women and/or sex/gender differences. Applicants are typical women, but both men and women are eligible.)

For additional information:

- on these announcements, contact Dr. Cora Lee Wetherington at [wetherington@nih.gov](mailto:wetherington@nih.gov) or at (301) 435-1319
- on NIDA funding opportunities, visit NIDA's homepage at <http://www.nida.nih.gov>
- visit the women and sex/gender differences site on NIDA's homepage at <http://www.drugabuse.gov/WHGD/WHGDHome.html>

National Institutes of Health - U.S. Department of Health and Human Services

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