

**COLLEGE ON PROBLEMS  
OF DRUG DEPENDENCE**

**June 16-21, 2007  
Quebec City, Canada**



*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 sex/gender is an important variable in treatment and prevention. To foster research on women and sex/gender differences in all areas of drug abuse research (both human and animal), since 1999, the National Institute on Drug Abuse (NIDA) has encouraged submission of abstracts on this topic for the annual meeting of the College on Problems of Drug Dependence (CPDD). The response has been very gratifying as evidenced by the numerous presentations on this topic in this year's CPDD program, as well as previous years' programs. NIDA is pleased to provide you with this special version of the CPDD program that highlights the program schedule for presentations related to women and sex/gender differences. 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. For those of you who have not become involved in sex/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 sex/gender differences, special NIDA Travel Awards have been granted annually since 1999. Each year these competitive travel awards have been given to approximately 30 junior investigators (students and investigators who are less than five years past the doctoral degree or residency) conducting research in this area and whose first-author 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 conduct research in the area of women and sex/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 2008 CPDD meeting in San Juan, Puerto Rico, June 14-19. We encourage you to apply. See the announcement on page 104.

Finally, for those of you who are interested in exploring funding opportunities for research on women and sex/gender differences, we have listed on page 103 information for competitive supplements and program announcements in this area.

For additional information on NIDA's Women and Sex/Gender Research Program, contact Dr. Cora Lee Wetherington (telephone 301-435-1319; [wetherington@nih.gov](mailto:wetherington@nih.gov)) or Dr. Samia Noursi (telephone 301-594-5622; [snoursi@nih.gov](mailto:snoursi@nih.gov)).

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## CPDD 2007 Women & Gender Junior Investigator Travel Awardees

<b>Nicole J. Amador</b> Hunter College	Estrous cycle effects on behavioral & physiological responses to formalin-induced inflammator pain (Page 20)
<b>Justin J. Anker</b> University of Minnesota	Allopregnanolone attenuates the reinstatement of cocaine-seeking behavior in female rats (Page 21)
<b>Emma Childs, Ph.D.</b> University of Chicago	Effects of acute psychological stress upon allopregnanolone (Page 6)
<b>Chris S. Culbertson</b> University of California	Gender differences in motivation to abstain from methamphetamine use (Page 9)
<b>Melissa A. Davey-Rothwell, Ph.D., M.P.H., CHES</b> Johns Hopkins University	Alternative approaches to controlling drug use: An examination of gender differences (Page 9)
<b>Catherine L. Dempsey, Ph.D.</b> University of Arizona	Gender differences in cessation support by partners of health-compromised smokers (P 16)
<b>Matt W. Feltenstein, Ph.D.,</b> Medical University of South Carolina	Progesterone pretreatment attenuates reinstatement of cocaine-seeking in freely cycling female rats (Page 21)
<b>Tracie J. Gardner, Ph.D.</b> Baylor College of Medicine	Gender differences in a cocaine vaccine trial of TA-CD/08 (Page 9)
<b>Eugenia C. Garvin</b> Washington University	Drug using women who inaccurately perceive sex risk are more likely to improve sex risk behaviors at 4 months (Page 10)
<b>Tonya M. Gerald, Ph.D.</b> North Carolina Central University	Sex-specific changes in opioid and dopamine receptors gene expression in striatum of CB <sub>1</sub> transgenic mice (Page 32)
<b>Lilian A. Ghandour, M.P.H.</b> Johns Hopkins University	Gender differences in alcohol use among university students in Lebanon: The role of religion and religiosity (Page 8)
<b>Valerie S. Harder, M.H.S.</b> Johns Hopkins University	Early onset cannabis problems and young adult major depression: Male-female version (Page 31)
<b>Emily L. R. Harrison, Ph.D.</b> Yale University	Gender differences in stress-induced cortisol reactivity in smokers (Page 6)
<b>Mathilde M. Husky, Ph.D.</b> Yale University	Gender differences in the comorbidity of smoking behavior and major depression (Page 24)
<b>Jennifer E. Johnson, Ph.D.</b> Brown University	Group IPT for women prisoners with comorbid substance abuse and depression (Page 29)
<b>Monique B. Kelly, Ph.D.</b> University of Pittsburgh	Drug use in pregnant women with mood disorders (Page 24)

<b>Kerry A. Kerstetter</b> University of California, Santa Barbara	Incubation of cocaine-seeking behavior is enhanced and more enduring in female relative to male rats (Page 21)
<b>Kristin M. Lester, Ph.D.</b> VA Boston Healthcare System	Differential risks and expectations: A comparison of male and female cocaine-dependent outpatients entering treatment (Page 9)
<b>Orna Levran, Ph.D.</b> The Rockefeller University	<i>ABCB1</i> genetic variability and opiate dependence in Caucasians (Page 25)
<b>Silvia S. Martins, M.D., Ph.D.</b> Johns Hopkins University	Gender differences in conditional substance dependence by psychiatric diagnosis in the U.S. population (Page 12)
<b>Clifford C. Michaels</b> Emory University	Early postnatal stress, as modeled by maternal separation, alters morphine-induced conditioned place preference in male offspring, but not in females (Page 6)
<b>Peter T. Morgan, M.D., Ph.D.</b> Yale University	Gender differences in sleep and sleep-dependent learning in abstinent cocaine users (Page 10)
<b>Megan E. Piper, Ph.D.</b> University of Wisconsin	Gender differences in tobacco dependence measures and withdrawal (Page 33)
<b>Peter G. Roma, M.A.</b> American University	Dissociation between physiological and motivational effects of alcohol in female Fischer & Lewis rats (Page 20)
<b>Katharine M. Seip</b> Rutgers University	Cocaine-induced locomotor sensitization during conditioning and locomotor rates during test may predict resulant place preference in lactating dams (Page 21)
<b>Michele Staton-Tindall, Ph.D., M.S.W.</b> University of Kentucky	Factors associated with substance abuse treatment utilization among male and female incarcerated substance users (Page 18)
<b>Golfo K. Tzilos, M.A.</b> Wayne State University	The association between drug use and intimate partner violence among pregnant women: The importance of the recipient-perpetrator distinction (Page 23)
<b>Tomoko Udo, M.S.</b> Rutgers University	Gender differences in the effects of alcohol on emotional regulation in social drinkers (Page 8)
<b>Karla D. Wagner, M.A.</b> University of Southern California	The effect of intimate partner violence on receptive syringe sharing among young female injection drug users: An analysis of mediation effects (Page 29)
<b>Mary Waldron, Ph.D.</b> Washington University	Parental separation predicts early substance involvement in children of alcoholic female twins (Page 7)
<b>Matthew T. Weaver</b> University of Florida	Gender differences in parameter-dependent tolerance to the effects of cocaine in a modified interval schedule of reinforcement (Page 6)

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**Monday June 18, 2007**

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**POSTER SESSION I (Breakfast)**

**CCQ 200ABC  
8:00 - 10:00 AM**

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

**Set-up time begins Sunday 11:30 AM  
Must be removed by Monday 12:30 PM**

**STRESS**

- 1 *Early postnatal stress, as modeled by maternal separation, alters morphine-induced conditioned place preference in male offspring, but not in females*  
C.C. Michaels and S.G. Holtzman, Pharmacology, Emory University, Atlanta, GA
- 7 *Gender differences in HPA responses to stress and drug cues in cocaine patients compared with social drinking controls*  
K. Hong(1), H. Fox(1), M.J. Kreek(2) and R. Sinha(1), (1)Psychiatry, Yale University, New Haven, CT and (2)The Laboratory on the Biology of Addictive Diseases, Rockefeller University, New York, NY
- 10 *Stress reactivity in response to pharmacologic and psychological laboratory stress tasks: Impact of gender and smoking status*  
M.E. Saladin(1), S.E. Back(1), M.L. Verduin(1), A.E. Waldrop(1), S.D. Yeatts(1), J. Allen, M.J. Kreek(2) and K.T. Brady(1), (1)Medical University of South Carolina, Charleston, SC and (2)Rockefeller University, New York, NY
- 11 *Gender differences in stress-induced cortisol reactivity in smokers*  
E.L. Harrison, C.M. Mazure, R. Sinha, P. Allen, S. Coppola, N. Estevez and S. McKee, Psychiatry, Yale University School of Medicine, New Haven, CT
- 12 *Effects of acute psychological stress upon allopregnanolone*  
E. Childs and H. de Wit, University of Chicago, Chicago, IL
- 13 *Factor associated with anxiety levels following the Lebanon war among methadone maintenance treatment patients in two clinics in Israel*  
E. Lawental(1), E. Peles(2), S. Schreiber(2), M. Adelson(2) and M. Schori(3), (1)Haifa Drug Abuse Treatment Center and Tel Hai Academic College, Haifa, (2)Adelson Clinic for Drug Abuse Treatment and Research, Tel-Aviv, and (3)University of Haifa, Haifa, Israel
- 17 *Women's EMG and SCL response to a stressor during early recovery*  
C.M. Coyne, Psychosocial and Community Health, University of Washington, Seattle, WA

**ANIMAL BEHAVIOR: REINFORCEMENT**

- 21 *Gender differences in parameter-dependent tolerance to the effects of cocaine in a modified interval schedule of reinforcement*  
M.T. Weaver and M.N. Branch, Psychology, University of Florida, Gainesville, FL

**PHARMACOKINETICS AND CHEMISTRY**

- 53 *Synthesis and testing of neuroactive steroids as allosteric modulators of GABAA receptors*  
S.P. Runyon(1), H.A. Navarro(1), S. Schenk(3), M. Rogawski(2) and C.E. Cook(1),  
(1)Center for Organic and Medicinal Chemistry, RTI International, RTP, NC,  
(2)NINDS, NIH, Bethesda, MD and (3)Psychology, Victoria University of Wellington,  
Wellington, New Zealand

**CLUB DRUGS**

- 63 *Ecstasy-dependent users engage in more sexual risk behaviors than non-dependent ecstasy users*  
M.S. Fague(1), A. Ben Abdallah(1), S. Kurtz(2), J. Copeland(3) and L.B. Cottler(1),  
(1)Psychiatry, Washington University School of Medicine, St. Louis, MO, (2)University  
of Delaware, Coral Gables, FL and (3)University of New South Wales, St. Ives, NSW,  
Australia

**ADOLESCENTS**

- 68 *Gender differences in the earliest stages of drug involvement in Bogota, Colombia*  
C. López-Quintero and Y. Neumark, School of Public Health, Hebrew University of  
Jerusalem, Jerusalem, Israel
- 71 *Relationship between parent and child risk taking propensity as indexed by the Balloon Analogue Risk-Task*  
E.K. Reynolds, M.N. Sargeant, M.E. McFadden, S.A. McIntyre and C.W. Lejuez,  
University of Maryland, College Park, MD
- 75 *Tobacco and marijuana use before teenage pregnancy and 10 years later*  
N.M. De Genna and M.D. Cornelius, University of Pittsburgh, Pittsburgh, PA
- 77 *Parental separation predicts early substance involvement in children of alcoholic female twins*  
M. Waldron(1), A.C. Heath(1) and N.G. Martin(2), (1)Psychiatry, Washington  
University School of Medicine, St. Louis, MO and (2)Queensland Institute of Medical  
Research, Brisbane, QLD, Australia
- 79 *Gender differences in the relationship of peer influence and beliefs to adolescent substance use in a rural state*  
D. Clark, J.M. Webster, T.F. Garrity and D. Saman, University of Kentucky, Lexington,  
KY
- 94 *White matter organization and substance use disorders: A preliminary study in adolescents and young adults*  
D. Thatcher(1), J.L. Weston(1), S. Chickering(1), R.A. Terwilliger(2) and D.B. Clark(1),  
(1)Psychiatry, University of Pittsburgh, and (2)Carnegie Mellon University, Pittsburgh,  
PA



**OPIOID TREATMENT I**

- 100 *Individual differences to naloxone vs. placebo in opioid-dependent humans responding under a naloxone discrimination procedure: Influence of sex and methadone maintenance dose*  
M.P. Chopra, M. Mancino, Z. Feldman, J. McGaugh and A. Oliveto, Psychiatry and Human Behavior, University of Arkansas for Medical Sciences, Little Rock, AR

**GENDER, WOMEN**

- 121 *Estradiol modulation of d-amphetamine in premenopausal women: A dose-response study*  
S. Babalonis (1,3), J.A. Lile(1), C.S. Emurian(1), C.A. Martin(2) and T.H. Kelly(1,2,3), (1)Behavioral Science, (2)Psychiatry, and (3)Psychology, University of Kentucky, Lexington, KY
- 122 *Changes in mood, performance, food craving and food intake across the menstrual cycle in women with premenstrual dysphoric disorder*  
S. Shakibaie Smith, S. Collins, F.R. Levin and S.M. Evans, Psychiatry, Division of Substance Abuse, New York State Psychiatric Institute, New York, NY
- 123 *Polydrug use models among women in the autonomous region of Valencia, Spain*  
S. Tomás(1), A. Vidal-Infer(2), T. Samper(2) and J. Perez(3), (1)Dirección General de Drogodependencias, Conselleria de Sanitat, Generalitat Valenciana, and (2)FEPAD, Valencia, and (3)Hospital de la Santa Creu i Sant Pau, Barcelona, Spain
- 124 *Frequency and type of adverse events associated with treating women with trauma in community substance abuse treatment programs*  
T. Killeen(1), C. Brown(2), A. Campbell(3), H. Jiang(3), R. Sampson(1), E. Nunes(3) and D. Hien(3), (1)Medical University of South Carolina, and (2)Charleston Center, Charleston, SC, and (3)Columbia University, New York, NY
- 125 *Parenting stress, sense of competence and self-efficacy in mothers receiving outpatient drug treatment*  
M. Kerwin, C. Arabia and C. Williams, Psychology, Rowan University, Glassboro, NJ
- 126 *Gender differences in depression symptoms among substance users: Relationship with depression diagnosis*  
P.J. Seignourel, C. Green and J. Schmitz, Psychiatry and Behavioral Sciences, University of Texas - Houston, Houston, TX
- 127 *Gender differences in the effects of alcohol on emotional regulation in social drinkers*  
T. Udo(1,2), M.E. Bates(1), E. Vaschillo(1), B. Vaschillo(1), S. Ray(1) and E.Y. Mun(1), (1)Center of Alcohol Studies, Rutgers, State University of New Jersey, and (2) School of Public Health, University of Medicine and Dentistry of New Jersey, Piscataway, NJ
- 128 *Gender differences in alcohol use among university students in Lebanon: The role of religion and religiosity*  
L.A. Ghandour(1,2), E.G. Karam(2) and W.E. Maalouf(1,2), (1)Johns Hopkins School of Public Health, Baltimore, MD and (2)Institute for Development, Research, Advocacy and Applied Care, Beirut, Lebanon

- 129 *Stability in religious coping among methadone maintenance treatment patients, and gender differences*  
I. Cohen(1), E. Peles(1), Y. Benyamini(2) and M. Adelson(1), (1)Adelson Clinic for Drug Abuse Treatment and Research, Tel Aviv Medical Center, and (2)Tel Aviv University, Tel Aviv, Israel
- 130 *Gender differences among opiate users in a 25-year longitudinal follow-up study*  
C. Grella, Integrated Substance Abuse Programs, UCLA, Los Angeles, CA
- 131 *Gender differences among in- and out-of-treatment opioid-dependent individuals*  
S.M. Kelly(1), R.P. Schwartz(1), K.E. O'Grady(2), J.A. Peterson(1), S. Gwin-Mitchell(1) and B.S. Brown(1,3), (1)Friends Research Institute, Baltimore, and (2)University of Maryland, College Park, MD and (3)University of North Carolina, Wilmington, NC
- 132 *Alternative approaches to controlling drug use: An examination of gender differences*  
M.A. Davey-Rothwell, C.A. Latkin and K.E. Tobin, Health, Behavior and Society, Johns Hopkins Bloomberg School of Public Health, Baltimore, MD
- 133 *Gender differences in motivation to abstain from methamphetamine use*  
C.S. Culbertson, M.R. Costello, C.A. Kenny, D. Tziortzis, E. O'Laco, R. De La Garza and T.F. Newton, Psychiatry and Biobehavioral Sciences, David Geffen School of Medicine at University of California, Los Angeles, Los Angeles, CA
- 134 *Gender differences in self-reported reasons for cocaine use*  
T.M. Wright, P. Mardikian, S. LaRowe, K. Cochran and R. Malcolm, Psychiatry, MUSC, Charleston, SC
- 135 *On the rocks: Barriers to treatment-seeking among African-American women who are chronic crack users*  
R.S. Karg, W.M. Wechsberg, K.M. Sawyer and F. Browne, Substance Abuse Treatment Evaluations and Interventions, RTI International, Research Triangle Park, NC
- 136 *Effect of gender, age, and race on buprenorphine treatment outcome*  
D.A. Gorelick(1), I.D. Montoya(2), J.R. Schroeder(1), C. Contoreggi(1), R.E. Johnson(3,4), P.J. Fudala(4) and K.L. Preston(1), (1)NIDA/NIH, IRP, and (3)Johns Hopkins Univ., Baltimore, (2) NIDA/NIH, Rockville, MD, and (4)Reckitt Benckiser Pharmaceuticals, Inc., Richmond, VA
- 137 *Differential risks and expectations: A comparison of male and female cocaine-dependent outpatients entering treatment*  
K.M. Lester(1), L.M. Najavits(1) and R.D. Weiss(2), (1)National Center for PTSD, Women's Health Sciences Division, VA Boston Healthcare System, Boston, MA and (2)Alcohol and Drug Abuse Treatment Program, McLean Hospital, Belmont, MA
- 138 *Gender differences in a cocaine vaccine trial of TA-CD/08*  
T. Gardner(1,2), B. Martell(3), J. Poling(4,5), E. Mitchell(4,5) and T. Kosteni(1,2), (1)Baylor College of Med., and (2)Michael E. DeBakey VA Medical Center, Houston, TX, (3)Med. and (4)Psychiatry, Yale University Sch. of Med., New Haven, and (5)West Haven VAMC, West Haven, CT

- 139 *Gender differences in sleep and sleep-dependent learning in abstinent cocaine users*  
P.T. Morgan, P. Paliwal, R.T. Malison and R. Sinha, Psychiatry, Yale University, New Haven, CT
- 140 *Factor analysis of the Allen Barriers to Treatment Instrument with a clinical sample of female outpatient substance abusers*  
J. Lindsay, University of Texas Health Science Center at Houston, Houston, TX
- 141 *The role of locus-of-control in female crack/cocaine users*  
S. Bradford, A. Ben Abdallah, C. Callahan and L. Cottler, School of Medicine, Washington University in St. Louis, Saint Louis, MO

#### **HIV/HCV, IMMUNE FUNCTION**

- 151 *Disparities in health services for addiction-related infections in substance abuse treatment programs*  
L.S. Brown, Jr.(1,2), S.A. Kritz(1), E.J. Bini(3), J. Robinson(4), D. Alderson(5) and J. Rotrosen(6), (1)ARTC, Brooklyn, (2)Weill Cornell Med. Col., (3)Gastroenterology and (6)Psychiatry, VA NY Harbor Healthcare Sys. and NYU Sch. of Med., NY, NY  
(4)Nathan Kline Inst., Orangeburg, (5)NYS Psychiatric Inst., NY Presbyterian Hosp., New York, NY
- 155 *Study on drug use, sex behaviors, use of condoms and HIV risk among IDUs in Teku*  
M.B. Chhetri, Planning, CIAA, Kathmandu, Nepal
- 158 *Drug using women who inaccurately perceive sex risk are more likely to improve sex risk behaviors at 4 months*  
E.C. Garvin, A. Ben Abdallah and L.B. Cottler, Epidemiology and Prevention Research Group, Washington University School of Medicine, St. Louis, MO
- 160 *Gender differences in perceived vulnerability to HIV infection*  
M.M. Mitchell, S.G. Severtson, B.E. Mancha, C.M. Graham, W.W. Latimer, Mental Health, Johns Hopkins University, Baltimore, MD
- 164 *Gender differences in sex risks among Ukraine injection drug users*  
R.E. Booth, J.T. Brewster, W. Lehman, S. Dvoryak and L. Sinitsyna, Psychiatry, University of Colorado School of Medicine, Denver, CO
- 166 *Correlates of injection drug use among female sex workers in two Mexican-U.S. border cities*  
T.L. Patterson(1), R. Lozada(2), S. Semple(1), M. Fraga(3), J. Salazar(4), H. Staines(5), A. DelaTorre(6), M. Philbin(1) and S. Strathdee(1), (1)UCSD, La Jolla, CA, (2)Pro-COMUSIDA, and (3)Aut. de Baja Calif., Tijuana, (4)Aut. de Tamaulipas, Matamoros, (5)Aut. de Cd. Juarez, Cd. Juarez, Mexico and (6)University of California, Davis, CA

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**Monday June 18, 2007**

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**ORAL COMMUNICATIONS 5**

**CCQ 301AB**  
**10:00 AM - 12:00 PM**

**SOCIAL AND ENVIRONMENTAL FACTORS IN DRUG ABUSE**

Chairs: Sari Izenwasser and Jennifer Newman

- 10:00 *Cocaine discrimination in maternally separated and handled pups as adults*  
S.J. Kohut and A.L. Riley, Psychology, American University, Washington, DC
- 10:15 *The effects of social and environmental enrichment on cocaine self-administration in female rats*  
M.A. Smith and J.C. Iordanou, Psychology, Davidson College, Davidson, NC

**ORAL COMMUNICATIONS 6**

**CCQ 303AB**  
**10:00 AM - 12:00 PM**

**ALCOHOL RESEARCH: WHAT'S THE PROOF?**

Chairs: Timothy Wilens and George Kenna

- 10:15 *Stress, coping, and well-being among family members of women with substance use and psychiatric disorders*  
B.C. Moore(1), D.E. Biegel(2) and T.J. McMahon(1), (1)Psychiatry, Yale University School of Medicine, West Haven, CT and (2)Case Western Reserve University, Cleveland, OH
- 10:45 *Remission from alcohol dependence and sex differences in a community sample*  
N. Dasgupta(1,2) and H.D. Chilcoat(2), (1)Epidemiology, University of North Carolina School of Public Health at Chapel Hill, Chapel Hill, NC and (2)Worldwide Epidemiology, GlaxoSmithKline, Research Triangle Park, NC
- 11:00 *Persons entering residential substance abuse treatment in Los Angeles: How gender, depression and alcohol disorders are related to substance abuse retention*  
S.B. Hunter(1), K. Watkins(1), S. Wenzel(1) and J. Gilmore(2), (1)RAND Health, Santa Monica, and (2)Behavioral Health Services, Gardena, CA
- 11:15 *Substance abuse problem severity among female DUI offenders as a function of rurality*  
M. Webster(1,2), D.B. Clark(2), D. Saman(2) and J. Pimentel(2), (1)Behavioral Science, and (2)Center on Drug and Alcohol Research, University of Kentucky, Lexington, KY

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**Monday June 18, 2007**

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**ORAL COMMUNICATIONS 7**

**CCQ 205ABC  
10:00 AM - 12:00 PM**

**COMORBIDITY: DOUBLE TROUBLE**

Chairs: Jennifer Tidey and Silvia Martins

- 10:15 *Personality and psychiatric co-morbidity discriminates pathological gamblers among same sex sib-pairs*  
D.S. Lobo(1,2), S. Martins(3,2), H. Tavares(2), J. Kennedy(1), H. Vallada(2) and V. Gentil(2), (1)CAMH, University of Toronto, Toronto, ON, Canada (2) Institute of Psychiatry, University of Km Paulo, Sao Paulo, Brazil and (3)Johns Hopkins Bloomberg School of Public Health, Baltimore, MD
- 11:30 *Gender differences in HIV risk behavior, traumatic event exposure, and PTSD in syringe exchange enrollees*  
J. Peirce, C.K. Burke, K.J. Neufeld, K.B. Stoller, M.S. Kidorf, and R.K. Brooner, Johns Hopkins University School of Medicine, Baltimore, MD
- 11:45 *Gender differences in conditional substance dependence by psychiatric diagnosis in the U.S. population*  
S.S. Martins(1)and D.A. Gorelick(2), (1)Mental Health, Johns Hopkins Bloomberg School of Public Health, and (2)NIDA/NIH, Intramural Research Program, Baltimore, MD

**ORAL COMMUNICATIONS 8**

**CCQ 301AB  
2:45 - 4:45 PM**

**BRINGING UP BABY: DEVELOPMENTAL EFFECTS OF DRUG ABUSE**

Chairs: Lisa Schrott and Veronica Accornero

- 2:45 *Abnormal brain myelination occurs following perinatal opioid exposure in the rat*  
S.E. Robinson(1), E.S. Sanchez(2), J.W. Bigbee(3) and C. Sato-Bigbee(2), (1)Pharmacology and Toxicology, (2)Biochemistry, and (3)Anatomy and Neurobiology, Virginia Commonwealth University, Richmond, VA
- 3:00 *Sex differences in motivation to self-administer cocaine during the transition from adolescence to adulthood in rats*  
W.J. Lynch, Psychiatry and Neurobehavioral Sciences, University of Virginia, Charlottesville, VA
- 3:15 *Lobeline-induced sex differences in adolescent rats: Females exhibit increased sensitivity to the hypoactive effects of lobeline*  
S.B. Harrod, Psychology, University of South Carolina, Columbia, SC

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## Monday June 18, 2007

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- 3:30 *Estimated effects of prenatal cocaine exposure on initial drug opportunity and use during early adolescence*  
V.H. Accornero(1), E.S. Bandstra(1), G.R. Simpson(1), M.K. Glavach(1), L. Xue(1), C.E. Morrow(1), C.B. McCoy(1) and J.C. Anthony(2), (1)University of Miami Miller School of Medicine, Miami, FL and (2)Michigan State University School of Human Medicine, East Lansing, MI
- 3:45 *The effects of prenatal cocaine and lead exposure on substance use risk in 11-year-old children using the ALEXSA*  
S. Minnes(1), L.T. Singer(1,2), S. Satayathum(2), A. Aguirre(1,2) and T. Ridenour(3), (1)General Medical Sciences, and (2)Pediatrics, Case Western Reserve University, Cleveland, OH and (3)Center for Education and Drug Abuse Research, University of Pittsburgh, Pittsburgh, PA
- 4:00 *Effects of prenatal toluene exposure on performance under a progressive-ratio reinforcement schedule*  
P. Cooper(1), J.H. Hannigan(2,1) and S. Bowen(1,2), (1)Psychology and (2)Obstetrics and Gynecology, Wayne State University, Detroit, MI
- 4:30 *Role of sex and developmental history on the antinociceptive response to acute oxycodone in adult rats*  
L.M. Schrott, G.S. Johnson, L.M. Franklin and J.B. Tatom, Pharmacology, LSU Health Sciences Center-Shreveport, Shreveport, LA

### ORAL COMMUNICATIONS 9

CCQ 205ABC  
2:45 - 4:45 PM

### CLEARING THE SMOKE: ELUCIDATING NICOTINE MECHANISMS OF ACTION

Chairs: Robert Pechnick and Bernard LeFoll

- 2:45 *Increased nicotine self-administration after prenatal exposure to nicotine in the rat*  
R.N. Pechnick(1,2), H. Nobuta(1), X. Liu(1), C. Bresee(1), R. Poland(1), J. Xu(1) and C. Wang(1), (1)Cedars-Sinai Medical Center, and (2)Brain Research Institute, Los Angeles, CA

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**Monday June 18, 2007**

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**ORAL COMMUNICATIONS 10**

**CCQ 303AB  
2:45 - 4:45 PM**

**CHRONIC DRUGS AND CHRONIC PAIN**

Chairs: Sudie Back and Peggy Compton

4:00 *Correlates and gender differences of chronic pain patients using prescription opiates: A pilot study*

S.E. Back(1), A.E. Waldrop(1), A.R. Smith(2), S. Reeves(2), B. Hicks(1), R. Payne(1) and K.T. Brady(1), (1)Psychiatry, Medical University of South Carolina, and (2)Anesthesia and Perioperative Medical University of South Carolina, Charleston, SC



**POSTER SESSION II (BREAKFAST)**

**CCQ 200ABC**

**8:00 - 10:00 AM**

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

**Set-up time begins Monday 1:00 PM  
Must be removed by Tuesday 12:30 PM**

**AMPHETAMINE/METHAMPHETAMINE**

- 1 *The rise in treatment admissions for methamphetamine use in Los Angeles County from 2001 through 2005*  
D.A. Crevecoeur, C. Snow, B. Rutkowski and R. Rawson, Integrated Substance Abuse Programs, University of California, Los Angeles, Los Angeles, CA
- 2 *Characteristics of female methamphetamine addicts entering residential drug treatment: Program implications*  
B. Crowell(1), C.F. Tirado(2)and R. Dorst(1), (1)Nexus Recovery Center Inc., and (2)University of Texas Southwestern Medical Center, Dallas, TX
- 3 *Methamphetamine and sex: Qualitative perspectives of women users*  
A. Hamilton, Psychiatry, University of California, Los Angeles, CA

**ALCOHOL: HUMAN STUDIES**

- 38 *HIV risk behaviors among female IDUs in developing and transitional countries*  
C.M. Cleland(1), D.C. Des Jarlais(2), T.E. Perlis(2) and G.V. Stimson(3), (1)NDRI Inc., and (2)Beth Israel Medical Center, New York, NY and (3) Imperial College of Science, Technology, and Medicine, London, UK
- 39 *Male female differences in alcohol-related attitudes: Data from purposive sample surveys of adults in Slovenia: 2001-2005*  
M. Radovanovic(1) and Z. Cebasek-Travnik(2), (1)Epidemiology, Michigan State University, East Lansing, MI and (2)University Psychiatric Hospital, Ljubljana, Slovenia
- 40 *Drinking contexts, gender, and culture in Peru*  
M. Piazza, I. Bustamante, G. Alvarado, D. Pedersen and P. Asenjo, School of Public Health, Universidad Peruana Cayetano Heredia, Barranco, Peru
- 51 *Social support networks for mothers with problem drinking*  
E. Rosof(1) M. Gwadz(2), N. Leonard(2) and L. Rotko(2), (1)Medical and Health Research Association, and (2)National Development and Research Institutes, Inc., New York, NY



**NEUROIMAGING**

- 54 *Neurobiological and behavioral predictors of social rank in female monkeys*  
P.W. Czoty(1), N.V. Riddick(1), H.D. Gage(2), M. Icenhower(1), M.C. Bounds(2), J.R. Kaplan(3), A.J. Bennett(1,3), P.J. Pierre(1,3) and M.A. Nader(1,2), (1)Physiology and Pharmacology, (2)Radiology, and (3)Pathology-Comparative Medicine, Wake Forest University School of Medicine, Winston-Salem, NC

**NICOTINE: HUMAN STUDIES**

- 71 *Self-administration of intravenous nicotine in male and female smokers*  
M. Sofuoglu(1), S. Yoo(1), K. Hill(1) and M. Mooney(2), (1)Psychiatry, Yale University, New Haven, CT and (2)Psychiatry, University of Minnesota, Minneapolis, MN
- 77 *Sex difference in smoking and abstinence on self-reports of mood, cigarette craving, and withdrawal symptoms*  
A. Azizian(1), J. Xi(2), J. Monterosso(1), C.P. Domier(1), A.L. Brody(1) and E.D. London(1,2,3), (1)Psychiatry and Biobehavioral Sciences, (2)Molecular & Medical Pharmacology, and (3)Brain Research Institute, David Geffen School of Medicine, UCLA, Los Angeles, CA
- 95 *Gender differences in cessation support by partners of health-compromised smokers*  
C.L. Dempsey, M.J. Rohrbaugh and V. Shoham, Psychology, University of Arizona, Tucson, AZ
- 96 *Male female and between-country differences in tobacco dependence diagnostic assessments: Colombia and United States*  
H. Cheng(1), P. Jose(2) and J. Anthony(1), (1)Michigan State University, East Lansing, MI and (2) Saldarriaga Concha Foundation, Cartagena, Colombia
- 97 *Smoking patterns and problems among male and female youth in Palestine*  
M.S. AlAfifi(1), M. Kariri(2) and S. ElSousi(1), (1)Substance Abuse Research Center, and (2)Ministry of Health, Gaza
- 99 *A child's intentions to smoke tobacco and later onset of smoking: A longitudinal study of male-female differences*  
Y.G. Flores-Ortega and J.C. Anthony, Epidemiology, Michigan State University, East Lansing, MI

**COMORBIDITY I**

- 101 *Meta-analysis of associations of depression and substance use and impairment in intravenous drug users*  
K.R. Conner(1), M. Pinquart(2) and P.R. Dubersteini, (1)University of Rochester Medical Center, Rochester, NY and (2)Friedrich Schiller University, Jena, Germany

- 104 *Psychiatric symptom improvement in women following group substance abuse treatment: Results from the Women's Recovery Group study*  
R. McHugh(1), M. Lincoln(2), R. Popuch(2) and S.F. Greenfield(2,3), (1)Boston University, Boston, MA, (2)McLean Hospital, Belmont, MA and (3)Psychiatry, Harvard Medical School, Boston, MA
- 105 *An analysis of the prevalence and persistence of psychotic behaviors in cocaine- vs. methamphetamine-dependent participants*  
J.J. Mahoney, III, R. De La Garza, P. Yurovsky, A.R. Dillon, A.D. Kalechstein and T.F. Newton, Psychiatry and Biobehavioral Sciences, David Geffen School of Medicine at UCLA, Los Angeles, CA
- 113 *Single-gender group treatment for substance use disorders improves outcomes for women with high psychiatric severity*  
S.F. Greenfield(2), J.P. Potter(1,2), R.E. Popuch(1), M.F. Lincoln(1) and R.J. Gallop(3), (1)Alcohol and Drug Abuse Treatment Program, McLean Hospital, Belmont, and (2)Psychiatry, Harvard Medical School, Boston, MA and (3)Mathematics, West Chester University, West Chester, PA
- 114 *Characteristics of alcoholics with comorbid anxiety or depression in an ongoing, placebo-controlled trial of acamprosate*  
C. Tyson and S.C. Sonne, Medical University of South Carolina, Charleston, SC
- 120 *Patterns of prescription drug misuse, illicit drug use, and mental health problems in the Miami club culture*  
H.L. Surratt, J.A. Inciardi and S.P. Kurtz, University of Delaware, Coral Gables, FL
- 128 *Conflict tactics of opiate-dependent men and women*  
A. Alvanzo and E. McCance-Katz, Virginia Commonwealth University, Richmond, VA
- 132 *Increased risk among traveling young injection drug users*  
P. Lum, J. Ford, A. Paciorek, K. Shafer and J. Hahn, University of California at San Francisco, San Francisco, CA

## **ORAL COMMUNICATIONS 11**

**CCQ 301AB**  
**10:00 AM - 12:00 PM**

### **HIV/AIDS**

Chairs: Clyde McCoy and Lisa Metsch

- 10:00 *Clustering of high-risk sex behaviors among men and women drug users*  
C.B. McCoy(1), V. DeGruttola(2) and M. Comerford(1), (1)University of Miami, Miami, FL and (2)Harvard University, Cambridge, MA

10:15 *Sexual-risk behavior among female crack users in Sao Paulo, Brazil*

S.A. Nappo(1,2), L.G. Oliveira(1,2)and Z.M. Sanchez(1,2), (1)Federal University of Sao Paulo, and (2)CEBRID, Sao Paulo, Brazil

**ORAL COMMUNICATIONS 12**

**CCQ 303AB**

**10:00 AM- 12:00 PM**

**Y GENDER XPLAINS THE DIFFERENCE**

**Chairs: Kathleen Brady and Andrea Stone**

10:00 *Gender differences in response to stress and cues in cocaine-dependent individuals*

K.T. Brady, A.L. McRae, S.E. Back, A.E. Waldrop, M.E. Saladin and S.D. Yeatts, Psychiatry, Medical University of South Carolina, Charleston, SC

10:15 *Changing gender trends in adolescent drug use*

A.L. Stone, Psychosocial and Community Health, University of Washington, Seattle, WA

10:30 *Who starts then stops cocaine use? United States, 2003*

G.F. Alvarado(1,2) and J.C. Anthony(2,1), (1)Public Health, Cayetano Heredia Peruvian University, Lima, Peru and (2)Epidemiology, Michigan State University, East Lansing, MI

10:45 *A gender-specific investigation of long-term drug use among an urban African-American cohort*

E.E. Doherty(1), K.M. Green(2) and M.E. Ensminger(2), (1)Mental Health, and (2)Health, Behavior, and Society, Johns Hopkins Bloomberg School of Public Health, Baltimore, MD

11:00 *Gender differences in methamphetamine use in youth and young adults treated for substance dependence*

M.E. Roth, C. Walker and V. Slaymaker, Butler Center for Research at Hazelden, Center City, MN

11:15 *Factors associated with substance abuse treatment utilization among male and female incarcerated substance users*

M. Staton-Tindall(1), J. Havens(1), C. Oser(1), M. Prendergast(2) and C. Leukefeld(1), (1)Behavioral Science, University of Kentucky, Lexington, KY and (2) Integrated Substance Abuse Programs, University of California, Los Angeles, Los Angeles, CA

11:30 *Role of individual, treatment, and post-treatment factors on sustained remission: Examining gender differences*

V. Stanick(1), A. Laudet(1)and B. Sands(2), (1)National Development Research Institute, and (2)Woodhull Medical Center, New York City, NY

- 11:45 *Gender as a moderator in the relationship between behavioral measures of risk-taking and impulsivity in a sample of inner-city, African-American substance users*  
B. Baker(1), C.W. Lejuez(1), M. Bornoalova(1), M.T. Tull(1) and B. Reynolds(2), (1)University of Maryland, College Park, MD and (2)Ohio State University, Columbus, OH



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**Wednesday June 20, 2007**

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**POSTER SESSION III (BREAKFAST)**

**CCQ 200ABC  
8:00 – 10:00 AM**

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

**Set-up time begins Tuesday 1:00 PM  
Must be removed by Wednesday 12:30 PM**

**ALCOHOL: ANIMAL STUDIES**

- 2 *Dissociation between physiological and motivational effects of alcohol in female Fischer & Lewis rats*  
P.G. Roma(1), S.A. Chen(2), C.S. Barr(2) and A.L. Riley(1),  
(1)Psychopharmacology Laboratory, Department of Psychology, American University, Washington, DC and (2)Laboratory of Clinical and Translational Studies, Section on Primate Studies, NIAAA, Poolesville, MD

**SEDATIVE-HYPNOTICS**

- 11 *Effect of task difficulty on a Morris water maze reversal task in rats prenatally exposed to toluene*  
J. Batis(1), S.E. Bowen(1,2) and J.H. Hannigan(1,2), (1)Psychology, Wayne State University, Detroit, MI and (2)Obstetrics & Gynecology, Wayne State University, Detroit, MI

**PAIN/ANALGESIA**

- 23 *Estrous cycle effects on behavioral and physiological responses to inflammatory pain*  
N.J. Amador(1,2), K.Y. Shivers(1,2), D. Hunter(1,2), G. Barr(1,2), S. Jenab(1,2) and V. Quinones-Jenab(1,2), (1)Psychology, Hunter College of CUNY, and (2)Biopsychology and Behavioral Neuroscience Doctoral Subprogram, Graduate Center of CUNY, New York, NY
- 24 *Developmental and hormonal effects on inflammatory responses to pain in female rats*  
K.Y. Shivers(1,2), N. Amador(1,2), D. Hunter(1,2), S. Jenab(1,2) and V. Quinones-Jenab(1,2), (1)Psychology, Hunter College of CUNY, New York, NY and (2) Biopsychology and Behavioral Neuroscience, Graduate School and University Center, CUNY, New York, NY

**COCAINE BEHAVIOR: ANIMALS STUDIES**

- 30 *Incentive salience of cocaine is remarkably similar across the postpartum period*  
M. Pereira, K.M. Seip, E.I. Dziopa and J.I. Morrell, Center for Molecular and Behavioral Neuroscience, Rutgers University, Newark, NJ

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## Wednesday June 20, 2007

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- 31 *Cocaine-induced locomotor sensitization during conditioning and locomotor rates during test may predict resulant place preference in lactating dams*  
K. Seip, M. Pereira, E. Dziopa and J. Morrell, Center for Molecular and Behavioral Neuroscience, Rutgers University, Newark, NJ
- 34 *Estrogen enhances conditioned place preference to cocaine*  
Y.M. Torres, Y. Arroyo and A.C. Segarra, Physiology, University of Puerto Rico, Medical Sciences Campus, San Juan, Puerto Rico
- 35 *Acute effects of progesterone and testosterone on cocaine self-administration by female nonhuman primates*  
N.K. Mello, J.H. Mendelson, I.M. Knudson, S.S. Negus and M. Kelly, Alcohol and Drug Abuse Research Center, McLean Hospital-Harvard Medical School, Belmont, MA
- 36 *Progesterone pretreatment attenuates reinstatement of cocaine-seeking in freely cycling female rats*  
M.W. Feltenstein, A.R. Henderson and R.E. See, Neurosciences, MUSC, Charleston, SC
- 37 *Allopregnanolone attenuates the reinstatement of cocaine-seeking behavior in female rats*  
J.J. Anker(1), E.B. Larson(2), N.A. Holtz(1), L.A. Gliddon(1) and M.E. Carroll(1), (1)Psychiatry, University of Minnesota, Minneapolis, MN and (2)Psychiatry, UT Southwestern, Dallas, TX
- 38 *Estrous cycle effects on DARPP-32 activity after acute cocaine*  
J. Weiner(1), W. Sun(1,2), L. Zhou(2), V. Quinones-Jenab(1,2) and S. Jenab(1,2), (1)Psychology, Hunter College of CUNY, and (2)Biopsychology and Behavioral Neuroscience Doctoral Subprogram, Graduate Center of CUNY, New York, NY
- 39 *Sex differences in the development of cocaine-induced behavioral sensitization and tolerance*  
L. Zhou(2,3), W. Sun(4), K. Weierstall(4), A.C. Minerley(4), S. Jenab(1,4) and V. Quinones-Jenab(1,3,4), (1)Psychology and (2)Biology, Hunter College, and (3)Grad. Ctr. of CUNY, (4)Biopsychology and Behavioral Neuroscience Doctoral Subprogram, Grad. Ctr. of CUNY, New York, NY
- 40 *Isoflurane anesthesia dampens cocaine-induced sensitization in the rat*  
D. Dow-Edwards, Physiology and Pharmacology, SUNY-Downstate, Brooklyn, NY
- 41 *Incubation of cocaine-seeking behavior is enhanced and more enduring in female relative to male rats*  
K.A. Kerstetter, V. Aguilar, M. Jachimowicz, R. Choy, C. Kaspar and T.E. Kippin, Psychology and Neuroscience Research Institute, University of California, Santa Barbara, CA

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**Wednesday June 20, 2007**

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**COCAINE BEHAVIOR: HUMAN STUDIES**

- 81 *Predicting medical care access among out-of-treatment drug-using women*  
C.W. Striley, L.B. Cottler, A. Ben Abdallah, Psychiatry, Washington U., St. Louis, MO
- 82 *Predictors of adult victimization among high risk, cocaine-using women*  
K. Vaddiparti, C. Callahan, A. Ben Abdallah and L.B. Cottler, Psychiatry, Washington University School of Medicine, St. Louis, MO
- 96 *Integrated intervention for abused women in drug treatment: Preliminary findings*  
B. Walton-Moss, M.E. McCaul and J. Campbell, Johns Hopkins University, Baltimore, MD
- 97 *Aftercare attendance partially moderated by history of physical abuse and gender*  
L. Haynes(1), A. Herrin, R. Carter(2), S. Back(1), K. Brady(1) and R. Hubbard, (1)Psychiatry Behavioral Science, and (2)Biostatistics, Bioinformatics, and Epidemiology, Medical University of South Carolina, Charleston, SC and (3)Clinical Research Institute, Duke University, Durham, NC

**PERINATAL EFFECTS OF DRUGS**

- 110 *The effect of plasma proteins on buprenorphine transfer across human placentas*  
R. Bowen, S. Patrikeeva, T.N. Nanovskaya, G. Hankins and M.S. Ahmed, OB/GYN Maternal Fetal Medicine, University of Texas Medical Branch, Galveston, TX
- 111 *Role of breast cancer resistant protein on transplacental transfer of methadone*  
T.N. Nanovskaya, S. Patrikeeva, S. Hemauer, G. Hankins and M.S. Ahmed, OB/GYN Maternal Fetal Medicine, University of Texas Medical Branch, Galveston, TX
- 112 *Effects of buprenorphine, methadone, L-acetyl methadole and their metabolites on pregnenolone formation by human placenta*  
O. Zharikova, S. Deshmukh, T.N. Nanovskaya, G. Hankins and M.S. Ahmed, OB/GYN Maternal Fetal Medicine, University of Texas Medical Branch, Galveston, TX
- 115 *Methadone in pregnancy: Treatment retention and neonatal outcomes*  
L. Burns(1), R.P. Mattick(1), C. Wallace(2) and K. Lim(2), (1)National Drug and Alcohol Research Centre, University of New South Wales, and (2)Centre for Epidemiology and Research, New South Wales Health Department, Sydney, NSW, Australia

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## Wednesday June 20, 2007

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- 116 *Substance use, psychological distress and violence among pregnant and breastfeeding Australian women*  
C. Wallace(1), L. Burns(2), S. Gilmour(2) and D. Hutchinson(2), (1)Public Health Training & Development Branch, NSW Health Department, and (2)National Drug and Alcohol Research Centre, Sydney, NSW, Australia
- 117 *Comparison of characteristics of opioid-dependent pregnant women in rural and urban settings*  
S.H. Heil(1,2), L.C. Trifiletti(1) and H.E. Jones(3), (1)Psychiatry, and (2)Psychology, University of Vermont, Burlington, VT, and (3)Psychiatry, Johns Hopkins University, Baltimore, MD
- 118 *A description of pregnant women seeking substance use treatment in Baltimore, MD*  
W.W. Latimer(1), S.G. Severtson(1), H. Jones(2), L. Jansson(1), V. Walters(1) and M. Tuten(1), (1)Mental Health, Johns Hopkins Bloomberg School of Public Health, and (2)Center for Addiction and Pregnancy, Johns Hopkins University, Baltimore, MD
- 119 *Correspondence between changes in cigarette smoking and caffeine use among pregnant women*  
R. Rogers, S.T. Higgins, S.H. Heil, C.S. Thomas and R.M. Vitale, University of Vermont, Burlington, VT
- 120 *Maternal nicotine exposure and characteristics of adolescent smoking behaviors: Preliminary findings*  
E.D. Thorner, M. Jaszyna-Gasior, C.C. Collins, M.K. Leff and E.T. Moolchan, NIDA, NIH, Baltimore, MD
- 121 *Self-report of psychopathology in a sample of pregnant smokers and pregnant quitters*  
T. Linares Scott, S.H. Heil and S.T. Higgins, Psychiatry, University of Vermont, Burlington, VT
- 122 *The association between drug use and intimate partner violence among pregnant women: The importance of the recipient-perpetrator distinction*  
G.K. Tzilos, S.J. Ondersma, J.R. Beatty and S. Chase, Department of Psychiatry and Behavioral Neurosciences, Wayne State University, Detroit, MI
- 123 *Prevalence and correlates of mood disorders among substance-dependent pregnant women in treatment*  
T. Mendelson, S.G. Severtson, C.H. Salama and W.W. Latimer, Department of Mental Health, Johns Hopkins Bloomberg School of Public Health, Baltimore, MD



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## Wednesday June 20, 2007

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- 124 *Screening for comorbid mood disorder among pregnant substance-dependent patients: Characteristics of the Addiction Severity Index and Beck Depression Inventory*  
M. Chisolm, M. Tuten, H. Jones and E. Strain, Johns Hopkins University School of Medicine, Baltimore, MD
- 125 *Drug use in pregnant women with mood disorders*  
M.B. Kelly, K.L. Wisner and M.D. Cornelius, Psychiatry, University of Pittsburgh, Pittsburgh, PA
- 126 *Prenatal marijuana exposure and PTSD among adolescents*  
C. Larkby, L. Goldschmidt, M.D. Cornelius and N.L. Day, Psychiatry, University of Pittsburgh Medical Center, Pittsburgh, PA
- 127 *Maternal trauma exposure, PTSD, mental representations and caregiving behavior: Implications for the mother-toddler attachment system*  
N. Schmitt, C. DeCoste and N. Suchman, Psychiatry, Yale University, New Haven, CT
- 128 *Maternal representations, reflective functioning, and caregiving behavior: Implications for intervention development*  
N. Suchman(1), C. DeCoste(1), N. Schmitt(1) and L. Mayes(2), (1)Psychiatry, Yale University School of Medicine, and (2)Yale Child Study Center, New Haven, CT
- 129 *Gender differences in provider's screening for perinatal substance use*  
C.B. Oser(1,2), E. Kleine(2), B. Ramlow(2,3) and C. Leukefeld(2,3), (1)Sociology, (2)Center on Drug and Alcohol Research, and (3)Behavioral Science, University of Kentucky, Lexington, KY

### COMORBIDITY II

- 135 *Gender differences in the comorbidity of smoking behavior and major depression*  
M.M. Husky, P. Paliwal, C.M. Mazure and S.A. McKee, Psychiatry, Yale School of Medicine, New Haven, CT
- 136 *The prevalence of depression symptoms in a population attending a tobacco treatment program in Brazil*  
E.C. Moreira, Medicine, CETAD/UFBA, Salvador, Brazil

### LITERATURE REVIEWS

- 169 *Epidemiology of alcohol and drug use in South Africa: A review*  
K. Peltzer(1), N. Phaswana-Mafuya(2) and B. Johnson(3), (1)HSRC, Pretoria, and (2)HSRC, Port Elizabeth, South Africa and (3)NDRI, New York, NY
- 173 *To what extent does gender identity, peer relationships, and parental relationships play a part in adolescent female substance use?*  
S. Renes, Olympic Educational Service District #114, Port Angeles, WA

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**Wednesday June 20, 2007**

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**SYMPOSIUM IX**

**CCQ 301AB  
10:00 AM - 12:00 PM**

**PROGESTERONE EFFECTS ON STRESS AND COCAINE INTAKE:  
TRANSLATION FROM THE LABORATORY TO THE CLINIC**

Chairs: Rajita Sinha and Nancy Mello

- 10:00 *Progesterone inhibits the escalation and reinstatement (relapse) of cocaine-seeking behavior*  
Marilyn Carroll, University of Minnesota, Minneapolis, MN
- 10:25 *Altered progesterone levels, stress response, craving and relapse susceptibility in cocaine-dependent women*  
Rajita Sinha, Yale University, Connecticut Mental Health Center, New Haven, CT
- 10:50 *The modulatory role of oral micronized progesterone on the effects of smoked cocaine in humans*  
Suzette M. Evans, Columbia University, New York, NY
- 11:15 *Progesterone effects on cocaine responses and cocaine intake: Laboratory and clinical trial findings*  
Mehmet Sofuoglu, Yale University, West Haven, CT

**ORAL COMMUNICATIONS 16**

**CCQ 205ABC  
1:30 - 3:30 PM**

**GENETICS: CRACKING THE CODE**

Chairs: Christian Schutz and Laurie Zawertailo

- 2:45 *ABCBI genetic variability and opiate dependence in Caucasians*  
O. Levran(1), S. Barral(1), E. Halperin(2), K. O'Hara(1), D. Li, J. Ott(1) J. Rotrosen, P. Casadonte, S. Linzy, M. Adelson and M.J. Kreek(1), (1)The Rockefeller University, New York, NY and (2)ISCI, Berkeley, CA

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**Wednesday June 20, 2007**

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**ORAL COMMUNICATIONS 18**

**CCQ 303AB  
3:45 - 5:45 PM**

**PRESCRIPTION OPIATE ABUSE: DEVIATING FROM THE SCRIPT**

**Chairs: Sharon Walsh and Stephen Butler**

- 4:45 *Risk factors for 30-day and 1-year adult prescription misuse: Effect of gender*  
T.S. Schepis and S. Krishnan-Sarin, Psychiatry, Yale University, New Haven, CT

**ORAL COMMUNICATIONS 20**

**CCQ 206AB  
3:45 - 4:45 PM**

**PHARMACOKINETICS: DATA THAT'S ON THE LEVEL**

**Chairs: Rinah Yamamoto and Andrew Norman**

- 4:15 *Pharmacokinetic and postnatal effects following acute methamphetamine administration in female rats during late-stage pregnancy*  
S.J. White(1), H.P. Hendrickson(2) and S.M. Owens(1), (1)Pharmacology and Toxicology, and (2)Pharmaceutical Sciences, University of Arkansas for Medical Sciences, Little Rock, AR

**POSTER SESSION IV (BREAKFAST)**

**CCQ200ABC  
8:00 - 10:00 AM**

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

**Set-up time begins Wednesday 1:00 PM  
Must be removed by Thursday 12:30 PM**

**OPIOIDS: ANIMAL STUDIES**

- 1 *Gender differences in MOP-r mRNA levels in Long-Evans rats*  
C.E. Smith(1), S.D. Schlussman(1), D. White(2), C. Michaels(2), K. Easterling(2), A. Ho(1), S.G. Holtzman(2) and M.J. Kreek(1), (1)Laboratory of the Biology of Addictive Diseases, Rockefeller University, New York, NY and (2)Emory University, Atlanta, GA

**MARIJUANA: HUMAN STUDIES**

- 51 *Prefrontal cortex morphometry in abstinent adolescent marijuana users: Subtle gender effects*  
K.L. Medina(1), B.J. Nagel(2), K.L. Hanson(1), T. McQueeny(1) and S.F. Tapert(1), (1)Psychiatry, UCSD San Diego, CA and (2)OHSU, Portland, OR
- 53 *Relation between neurobehavior disinhibition and substance use during adolescence in males and females*  
L. Kirisci, R. Tarter, S.B. Aytaclar and M. Vanyukov, Pharmaceutical Sciences, University of Pittsburgh, Pittsburgh, PA

**POLYDRUG TREATMENT II**

- 75 *Predicting continuous abstinence over three years among former polysubstance users: Toward a comprehensive model*  
A.B. Laudet(1) and W.L. White(2), (1)Center for the Study of Addictions and Recovery, NDRI, New York City, NY and (2)Chestnut Health Systems, Bloomington, IL
- 78 *Time to remission from alcohol, nicotine, and illegal drug dependence in the U.S.*  
H. Chilcoat(1,2) and D.J. Webb(1), (1)Worldwide Epidemiology, GlaxoSmithKline, Research Triangle Park, NC and (2)Mental Health, Johns Hopkins Bloomberg School of Public Health, Baltimore, MD
- 85 *The association between parental drug use and sex trade among drug-using women*  
A.L. Lawson, L.J. Floyd and W.W. Latimer, Department of Mental Health, Johns Hopkins Bloomberg School of Public Health, Baltimore, MD

- 86 *Latinas in primary relationships: Acculturation, relationship power, substance use and sexual risk behaviors*  
K. Ragsdale(1) and C. Gore-Felton(2), (1)National Development & Research Institutes, New York, NY and (2)Stanford University School of Medicine, Stanford, CA
- 87 *Substance use among transgender women in New York City*  
L.A. Nuttbrock, S. Hwahng and A. Rosenblum, Institute for Treatment and Services Research National Development and Research Institutes, New York, NY

## **MORTALITY**

- 98 *Prescription drug mortality among older women in rural Virginia*  
M.J. Wunsch(1), K. Nakamoto(2), W. Massello(4), G. Behonick(3) and S. Schnoll(5), (1)VA Col. of Osteopathic Med., (2)VA Tech, Blacksburg, VA, (3)Toxicology, U. of Massachusetts, Worcester, MA, (4)Western District Office of the Chief Medical Examiner, Roanoke, VA and (5)Pinney Assoc. Inc, Bethesda, MD

## **PREVENTION**

- 105 *Reducing risky relationships for HIV: Developing an intervention for hi-risk women*  
C.G. Leukefeld(1), M. Staton-Tindall(1), C. Oser(1), J. Inciardi(2), H. Surrat(2), P. Friedmann(4), F. Taxman(3) and J. Clarke(4), (1)University of KY, Lexington, KY, (2)University of DE, Coral Gables, FL, (3)VA Commonwealth University, Richmond, VA and (4)Brown University, Providence, RI
- 107 *Patterns of HIV testing among drug users in St. Petersburg, Russia*  
L.M. Niccolai(1), O. Toussova(2), S. Verevchkin(2), R. Helmer(1) and A. Kozlov(2), (1)Epidemiology and Public Health, Yale University, New Haven, CT and (2)Biomedical Center, St. Petersburg, Russian Federation
- 109 *Couples- vs. individual-based therapy for maternal drug users: Effects on children's adjustment*  
W.K. Lam(1), M.L. Kelley(2) and W.S. Fals-Stewart(3), (1)RTI International, Research Triangle Park, NC. (2) Old Dominion University, Norfolk, VA and (3)University of Rochester, Rochester, NY
- 110 *Preliminary findings on dyadic interactions from the Mothers and Toddlers Program, an attachment-based parenting intervention for substance-abusing mothers*  
C. DeCoste, N. Schmitt and N. Suchman, Yale University School of Medicine, West Haven, CT

- 111 *Psychopathology as mediator in the prediction of substance use by parental child abuse potential in girls*  
A.C. Mezzich and B.S. Day, Pharmaceutical Sciences, University of Pittsburgh, Pittsburgh, PA
- 112 *Enhancing identification of child maltreatment risk with indirect substance abuse items*  
S.J. Ondersma(1), J.R. Beatty(2,1), L. Strathdee(3) and A. Sykes(4), (1)Psychiatry and OB/GYN, (2)Psychology, (3)Karmanos Cancer Institute, and (4)Educational Psychology, Wayne State University, Detroit, MI
- 113 *The impact of parent gender on predictors of preschool problems in substance-abusing families*  
M. Burstein(1) and C. Stanger(2), (1)Behavioral Psychology, KKI, Johns Hopkins University School of Medicine, Baltimore, MD and (2)Center for Addiction Research, Psychiatry, University of Arkansas for Medical Sciences, Little Rock, AR
- 114 *The effect of intimate partner violence on receptive syringe sharing among young female injection drug users: An analysis of mediation effects*  
K.D. Wagner(1), S.M. Hudson(2), M. Latka(3), S.A. Strathdee(4), H. Thiede(5), M.E. Mackesy-Amity(6) and R.S. Garfein(4), (1)USC Sch. Med. Alhambra, (2)Health Res. Assoc., Los Angeles, CA, (3)NY Academy of Medicine, NY, NY, (4)UCSD Sch. of Medicine, San Diego, CA, (5)Public Health-Seattle & King County, Seattle, WA and (6)U. of Illinois, Chicago, IL
- 115 *Female IDUs' sex work and diminishing social support: Tanzanian women's independence and isolation*  
S. McCurdy(1), G.P. Kilonzo(2), M.T. Leshabari(3), S. Mujaya(2) and M. Williams(1), (1)Sch. of Public Health, U. of Texas Houston Health Science Ctr., Houston, TX, (2)Psychiatry, and (3)Sch. of Public Health, Muhimbili College of Health Sciences, Dar es Salaam, Tanzania

## **CRIMINAL JUSTICE**

- 124 *The treatment needs of females with a substance use disorder in the Puerto Rican prison system: Implications for treatment planning*  
A. Hernandez and C. Albizu-Garcia, Center for Evaluation and Sociomedical Research, UPR-Medical Sciences Campus, San Juan, Puerto Rico
- 125 *Group IPT for women prisoners with comorbid substance use and depression*  
J.E. Johnson and C. Zlotnick, Psychiatry and Human Behavior, Brown University, Providence, RI
- 128 *Treatment response of incarcerated female substance abusers*  
J.Y. Sacks, CIRP, NDRI, Inc., New York, NY

- 130 *Attitudes toward research among female offenders and generalizable methods for improving research ethics among high-risk populations*  
J.M. DuBois(1), L.B. Cottler(2) and C. Callahan(1), (1)Saint Louis University, and (2)Washington University School of Medicine, St. Louis, MO
- 132 *Methamphetamine use and high-risk sexual risk behaviors among incarcerated female adolescents with a sexually transmitted disease in Los Angeles County Juvenile Halls*  
J. Steinberg(1), M. Boudov(1), P. Kernde(1), C. Grella(2), and C. Kadrnka(3), (1)Los Angeles County Dept. of Public Health, (2)UCLA Integrated Substance Abuse Programs, Los Angeles, CA, and (3)Juvenile Court Health Ser., Dept. of Health Services, USC, Los Angeles, CA
- 133 *Gender effects on longitudinal models of marijuana use and sexual risk behavior among criminally involved adolescents*  
S. Schmiede, K. Seals, M. Broaddus and A. Bryan, University of Colorado at Boulder, Boulder, CO
- 135 *Childhood adverse events and current traumatic distress: A comparison of men and women prisoners*  
N.P. Messina and C. Grella, Integrated Substance Abuse Programs, UCLA, Los Angeles, CA
- 136 *The daily struggle: A qualitative study of the process of long-term abstinence from heroin use among female ex-offenders*  
N.J. Tiburcio, (1)Educational Opportunity and Diversity, Graduate Center of New York, (2)Criminal Justice, John Jay College of Criminal Justice, and (3)Research, National Development and Research Institutes, New York, NY
- 137 *The CO Women's Prison Project - Prelim. outcomes at 12 months post-prison exit: Comparing SA beh., HIV and other risk beh., and serv. needs/utiliz. of young and mature female offenders*  
M.L. Schoeneberger(1) and J.Y. Sacks(2), (1)NDRI-CIRP, Denver, CO and (2)NDRI-CIRP, New York, NY

#### **PROGRAM DESCRIPTION**

- 147 *"The female step" - Medical-social day center for drug-addicted prostitutes*  
H. Mell(1)and Y. Gur(2), (1)Israel National Antidrug Authority, Jerusalem, and (2)Israel Health Ministry, Tel Aviv, Israel
- 148 *Women only -therapeutic community for addict women*  
S. Lamberg and H. Mell, Israel National Antidrug Authority, Jerusalem, Israel
- 159 *Mobile clinic for women in prostitution and drugs*  
Y. Goor(1), T. Shohat(2), S. Bueno de Mesquita(3) and L. Levin(4), (1)Director, Levinski Clinic, (2)District Health Office, Ministry of Health, (3)Levinski Clinic, and (4)Tel-Aviv University, Tel-Aviv, Israel

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**Thursday June 21, 2007**

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**SYMPOSIUM XV**

**CCQ 206AB**  
**10:00 AM - 12:00 PM**

**INDIVIDUAL DIFFERENCES IN STRESS RESPONSE: SEX, SMOKING  
AND SNP'S (SINGLE NUCLEOTIDE POLYMORPHISMS)**

Chairs: Harriet de Wit and Gary Wand

10:00 *Determinants of acute stress response: Sex, personality, smoking and genetics*  
Emma Childs, University of Chicago, Chicago, IL

11:15 *Stress reactivity in cocaine-dependent individuals: The impact of gender and task*  
Kathleen Brady, Medical University South Carolina, Institute of Psychiatry, Charleston, SC

**ORAL COMMUNICATIONS 21**

**CCQ 205ABC**  
**10:00 AM - 12:00 PM**

**EPIDEMIOLOGY: BY THE NUMBERS**

Chairs: Meredith Smith and Carlos Rios-Bedoya

10:30 *Gender and the prevalence and correlates of substance use disorders among 12-21 year-olds in the US*  
W. Becker(1), J.M. Tetrault(2,1), L. Sullivan(1) and D. Fiellin(1), (1)Yale University, New Haven, CT and (2)West Haven VA Hospital, West Haven, CT

11:15 *Early onset cannabis problems and young adult major depression: Male female variation*  
V.S. Harder(1), E.A. Stuart(1) and J.C. Anthony(2), (1)Mental Health, Johns Hopkins University, Baltimore, MD and (2)Epidemiology, Michigan State University, East Lansing, MI



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**Thursday June 21, 2007**

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**ORAL COMMUNICATIONS 22**

**CCQ 301AB**  
**10:00 AM - 12:00 PM**

**MARIJUANA AND CANNABINOIDS: WEEDING OUT MECHANISMS**

Chairs: Scott Rawls and Diana Dow-Edwards

- 10:45 *Sex-specific changes in opioid and dopamine receptors gene expression in striatum of CBI transgenic mice*  
T.M. Gerald(1), A. Howlett(2) and S.O. Franklin(1), (1)North Carolina Central University, Durham, NC and (2)Wake Forest University, Winston-Salem, NC
- 11:00 *Sex differences in the locomotion-depressing effects of tetrahydrocannabinol during adolescence*  
L.C. Harte and D. Dow-Edwards, Physiology/Pharmacology, SUNY Downstate, Brooklyn, NY

**ORAL COMMUNICATIONS 23**

**CCQ 303AB**  
**10:00 AM - 12:00 PM**

**NOVEL PHARMACOTHERAPIES: SAY "NO" TO THE STATUS QUO**

Chairs: Ryan Lanier and Adam Bisaga

- 11:00 *Efficacy of a cocaine vaccine for the treatment of cocaine dependence in methadone-maintained patients*  
B.A. Martell(1), E. Mitchell(2,3), J. Poling(2,3), T. Gardner(4,5) and T.R. Kosten(4,5), (1)Medicine, and (2)Psychiatry, Yale Univ. School of Medicine, New Haven, and (3)West Haven, (4)VAMC, West Haven, CT, Baylor College of Medicine, and (5)Michael E. DeBakey VAMC, Houston, TX

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**Thursday June 21, 2007**

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**ORAL COMMUNICATIONS 25**

**CCQ 303AB**  
**2:00 - 4:00 PM**

**NICOTINE TREATMENT**

Chairs: Ryan Vandrey and Carl Lejuez

2:00 *Gender differences in tobacco dependence measures and withdrawal*  
M.E. Piper, S.S. Smith, M.C. Fiore and T.B. Baker, School of Medicine and Public Health, University of Wisconsin, Madison, WI

2:15 *Menstrual phase effects on smoking cessation: A pilot feasibility study*  
M. Carpenter(2), M. Saladin(1), S. LaRowe(1), A. Leinbach(1) and H. Upadhyaya(1), (1)Psychiatry & Behavioral Sciences, and (2)Hollings Cancer Center, Medical University of South Carolina, Charleston, SC

**SYMPOSIUM XVII**

**CCQ206AB**  
**3:00 - 4:00 PM**

**PRIMARY FINDINGS FROM HIV/AIDS RESEARCH IN THE NIDA CLINICAL TRIALS NETWORK**

Chair: Donald A. Calsyn

3:20 *Primary results from CTN HIV/STD safer sex skills groups for women*  
Susan Tross, New York State Psychiatric Institute, New York, NY

## ABSTRACTS

### **ESTIMATED EFFECTS OF PRENATAL COCAINE EXPOSURE ON INITIAL DRUG OPPORTUNITY AND USE DURING EARLY ADOLESCENCE**

*V.H. Accornero(1), E.S. Bandstra(1), G.R. Simpson(1), M.K. Glavach(1), L. Xue(1), C.E. Morrow(1), C.B. McCoy(1) University of Miami Miller School of Medicine, Miami, FL and (2) Michigan State University School of Human Medicine, East Lansing, MI*

**AIM:** To examine the impact of prenatal cocaine exposure (PCE) on the earliest stages of drug involvement.

**METHODS:** Data were collected in the context of the longitudinal Miami Prenatal Cocaine Study (MPCS).

Enrolled at birth, the MPCS sample included 253 cocaine-exposed and 223 non-exposed full-term infants born to inner-city African-American women. This report focuses upon an early adolescent follow-up of the MPCS cohort.

The “Communities That Care” assessment was adapted to include questions about age at first drug exposure opportunities and first drug use. Life table and survival analysis methods were used to estimate suspected associations linking prenatal cocaine exposure to age-specific risk of (a) having a first drug exposure opportunity, and (b) initiating actual drug use, with log rank and likelihood ratio tests for p-values. **RESULTS:** Among the 390 MPCS adolescents assessed to date (median age 12-13 years), the estimated probability of experiencing a chance to try alcohol, tobacco, marijuana, and/or cocaine by age 11 was 30% for youths without PCE and 27% for those with PCE ( $p>0.10$ ). Estimates for chances to try each of the individual drugs were somewhat smaller, yielding no statistically robust PCE associations with any of the drugs considered separately ( $p>0.10$ ). Actual use of alcohol, tobacco, marijuana, and cocaine was less frequent. For example, an estimated 10% of the non-PCE youths had initiated alcohol use by age 13; 14% of the PCE youths had done so, but there was no statistically robust PCE association ( $p>0.3$ ). **DISCUSSION:** Hypothesized precocious drug involvement by youths with a past history of prenatal cocaine exposure was not found. Future work will investigate whether prenatal cocaine exposure is associated with earlier onset and more rapid transition to later stages of drug involvement (e.g., repeated use, dependence). **ACKNOWLEDGMENTS:** K01DA16720; R01DA06556; M01RR16587

### **SMOKING PATTERNS AND PROBLEMS AMONG MALE AND FEMALE YOUTH IN PALESTINE**

*M.S. AlAfifi(1), M. Kariri(2) and S. ElSousi(1), (1) Substance Abuse Research Center and (2) Ministry of Health, Gaza*

An “Early Warning System for Drug Abuse among Youth in Palestine” was developed as a joint work to study the smoking patterns and related problem behavior among high school age youth (ages 12-18 years). The study was conducted in Gaza Strip (GS) ( N = 1034 ) and West Bank (WB) (N= 1173 ). The data collection instrument used for this study was developed from the U.S. National Institute on Drug Abuse (NIDA) Monitoring the Future - Adolescent Drug Use Survey (Johnston, et al., 2001); the U.S. Substance Abuse and Mental Health Services Administration (SAMHSA) National Household Survey on Drug Abuse (2001, 2003). A number of determinants related to tobacco use were included in the study: access and availability, peers, smoking parents, socio-economical situation, environmental tobacco smoke (ETS) exposure, cessation, media and advertising, and school curriculum. A comparison of smoking between 1997, 2001, and 2004 shows an increase of ever life time behavior from 12% to 18%, to 23.5%. Presently, 26% boys and 2.5% girls in GS, and 35% boys and 5.2% girls in the WB report ever life time smoking. The average age of first time smoking is 13 years. About 19% of students report any tobacco product use in the past 30 days (males - 22.1% significantly more likely than females - 14.5%). Male students who smoke tend to be more likely than non smokers to use other drugs (e.g., Alcohols, psycho-active tablets, inhalants, marijuana, and heroin ) and have problem behaviors such as hanging around in the streets in the evening (49% vs. 30.3%) and the number of days absent from school (2.4 days vs. 0.92 days). Unlike current US and European studies that show little, if any, difference in smoking patterns based on gender status, tobacco use is significantly more prevalent among males than females in Gaza and the West Bank. Based on these results, a joint project is being developed to address adolescent smoking cessation among high school age youth. Project EX, a SAMHSA national model for smoking cessation, will be adopted and evaluated for use among Gaza and the West Bank youth.

## **CONFLICT TACTICS OF OPIATE-DEPENDENT MEN AND WOMEN**

*A. Alvanzo and E. McCance-Katz, Virginia Commonwealth University, Richmond, VA*

Introduction: The purpose of this study was to describe the conflict behaviors of a sample of opiate dependent men and women. Methods: Participants were 30 opiate dependent, HIV negative men and women recruited as part of a larger study examining the interaction of buprenorphine and antiretrovirals. Data was collected using the Revised Conflict Tactics Scales (CTS2), a 78-item questionnaire that assesses the extent to which specific tactics are used by couples during conflict. The CTS2 has 5 scales that assess the use of Negotiation (tactics oriented towards constructive solutions), Psychological aggression, Physical assault, Injury, and Sexual coercion. All subjects were offered information about community resources for intimate partner violence and sexual assault at the time of screening. Results: Demographically, subjects were in their mid 30's (mean age 34.3, SD 9.60), had completed 11.7 years of school (SD 1.39), and were predominantly African American (70.0%). About ¾ were single (76.7%) and approximately 1/3 (33.3%) lived with an intimate partner. The majority were men (65.5%). An overwhelming majority of subjects reported that they (90%) and their partners (93.3%) used negotiation. Similarly, the majority reported use of psychological aggression- self (86.7%) and partner (93.3%). Forty percent of the sample endorsed the use of physically assaultive behaviors by themselves and their partners and about 1/3 reported that they (26.7%) or their partner (30%) had sustained an injury as a result of violent conflict. About ¾ (76.7%) of subjects endorsed their own use of sexually coercive behaviors and almost half (46.7%) reported that their partners were sexually coercive. There were no statistical differences between men and women. Conclusions: The results of this pilot study suggest that the use of violent and abusive behaviors is prevalent in the relationships of opiate dependent persons. Study findings support the need for assessment and appropriate referral for both intimate partner victimization and perpetration in persons being treated for opiate dependence.

## **WHO STARTS THEN STOPS COCAINE USE? UNITED STATES, 2003**

*G.F. Alvarado(1,2) and J.C. Anthony(2,1), (1) Public Health, Cayetano Heredia Peruvian University, Lima, Peru and (2) Epidemiology, Michigan State University, East Lansing, MI*

Background & Aims: Population prevalence of cocaine use is sustained not only by who starts to use each year, but also by users who fail to stop consuming cocaine - due to reasons such as cocaine dependence. This research contributes new evidence on who has started to use cocaine, but hasn't stopped -- with a focus on male-female differences. METHODS: Recruited during nationally representative sampling for the 2003 National Survey on Drug Use and Health, the 6,882 cocaine users in this study's sample were self-identified via confidential interviews. We sorted these users into three mutually exclusive categories: (1) used cocaine within the past 30 days (~10% of users); (2) used within past 12 months but not in the past 30 days (~10%), (3) used before that (all others), prior to multinomial logistic regressions. RESULTS: Males were over-represented among persisting cocaine users (estimated relative risk, RR=1.5; p<0.05); among users, being female was associated with cessation of cocaine use. Independently, crack-cocaine smoking was associated with greater persistence of cocaine use, once it starts (RR~1.6-2.5; p<0.05). A past history of using multiple drugs before onset of cocaine use also was associated, independently, with persistence of cocaine use (RR~2.5; p<0.05). DISCUSSION: Epidemiologists typically have focused attention on risk of starting to use cocaine and becoming cocaine dependent, but here we shift focus to persistence/cessation of use. What we find is that excess prevalence of cocaine use among males is influenced by males' greater likelihood to remain engaged in cocaine use, as compared to female cocaine users. The male excess risk of starting to use cocaine, observed elsewhere, is a quite separate determinant of male-female differences in prevalence and risk of cocaine use. Crack-smoking and past use of multiple drugs are not as strong in their influence on persistent use as we had expected. SUPPORT: NIDA/NIH/FIC awards: D43TW05819; K05DA015799.

## **ESTROUS CYCLE EFFECTS ON BEHAVIORAL AND PHYSIOLOGICAL RESPONSES TO INFLAMMATORY PAIN**

*N.J. Amador(1,2), K.Y. Shivers(1,2), D. Hunter(1,2), G. Barr(1,2), S. Jenab(1,2) and V. Quinones-Jenab(1,2), (1) Psychology, Hunter College of CUNY and (2) Biopsychology and Behavioral Neuroscience Doctoral Subprogram, Graduate Center of CUNY, New York, NY*

The complexity of the female endocrinological cycle is likely to have an influence on these sex differences observed in nociceptive responses; where intrinsic hormonal changes may alter the perception of pain. However, the mechanisms underlying the sexually dimorphic responses to inflammatory pain remain unclear. The aim of this study was to determine whether endogenous hormonal fluctuations during the estrous cycle of the Sprague-Dawley rat affect behavioral responses to chronic inflammatory pain and/or inflammatory-mediated intracellular mechanisms. The behavioral responses of 55 rats to 5% formalin were recorded for 60 minutes post-formalin injection using a computerized model. Serum levels of prostaglandin E2 (PGE2) and corticosterone, important mediators in inflammatory responses, were examined using the enzyme immunoassay or radioimmunoassay kits, respectively. The stage of the estrous cycle affected behavioral responses during both Phase I and II of the

formalin-induced behavioral responses. Females in metestrus have significantly higher flinching responses in Phase I than those in proestrus or estrus. However, females in proestrus have significantly lower flinching responses during Phase II than those females in the estrus stage of the cycle. After formalin administration, the estrous cycle stage also significantly affected corticosterone serum levels; females in diestrus displayed significantly increased corticosterone serum levels when compared to females in estrus. Furthermore, females in metestrus also had significantly higher PGE2 serum levels than females in estrus. Taken together, our results suggest that fluctuations during the estrous cycle affect behavioral responses to inflammatory pain as well as physiological responses associated with inflammation. Supported by: SCORE 506-GM60654, MIDARP DA12136 and SNRP NS41073.

**ALLOPREGNANOLONE ATTENUATES THE REINSTATEMENT OF COCAINE-SEEKING BEHAVIOR IN FEMALE RATS**  
*J.J. Anker(1), E.B. Larson(2), N.A. Holtz(1), L.A. Gliddon(1) and M.E. Carroll(1), (1) Psychiatry, University of Minnesota, Minneapolis, MN and (2) Psychiatry, UT Southwestern, Dallas, TX*

Results from previous research indicate that estradiol benzoate (EB) enhanced, while progesterone (P) decreased, cocaine seeking-behavior in ovariectomized (OVX) rats. Allopregnanolone (ALLO), a metabolite of P, decreased the sensitizing effects of cocaine and reduced lethality associated with cocaine-overdose in mice. The purpose of this study was to examine the effects of ALLO on the reinstatement of cocaine-seeking behavior in female rats, comparing results to previously tested groups receiving estradiol benzoate (EB), P, or vehicle (VEH). Rats with i.v. catheters received either OVX or sham surgery (SH), and they were then trained to lever press for 0.4 mg/kg cocaine infusions under a FR 1 schedule during daily 2-hr sessions until behavior stabilized for 14 days. Cocaine was then replaced with saline, and a 21-day extinction period began. Next, rats were separated into 3 groups (OVX+ALLO, OVX+EB+ALLO, and SH+ALLO), the house light, lever lights, and pump were disconnected, and VEH, ALLO, or EB+ALLO were administered 30 min prior to the commencement of each session for 5 days. After 3 days of hormone treatment, rats received a reinstatement procedure in which a i.p. saline or cocaine (10 mg/kg) priming injection was administered at the beginning of the session. These groups were compared to 5 additional groups (OVX+VEH, OVX+EB+P, OVX+EB, SH+P, and SH+VEH) that had been tested under similar conditions. Responding during the maintenance and extinction phases was similar in all groups. Initial results indicate that ALLO reduced cocaine-induced reinstatement to an equal or greater extent than P. Earlier results indicated that P reduced reinstatement in the SH+VEH and OVX+E groups to a significantly low level that was comparable to the OVX+VEH rats. The suppression of cocaine-induced reinstatement following administration of ALLO and P suggests a role for P and its metabolite ALLO in the prevention of cocaine relapse in female cocaine users. Supported by NIDA grants R01 DA03240 and K05 DA15267 (MEC).

**SEX DIFFERENCE IN SMOKING AND ABSTINENCE ON SELF-REPORTS OF MOOD, CIGARETTE CRAVING, AND WITHDRAWAL SYMPTOMS**

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Women are more likely than men to relapse after initiating smoking cessation even though they generally smoke fewer cigarettes and are less dependent on nicotine than men who smoke. The reasons for this phenomenon are not clear, but they could reflect problems related to mood, cigarette craving or withdrawal. To explore this possibility, we compared self-reports on the Profile of Mood States, the Shiffman-Jarvik Nicotine Withdrawal Symptom Scale, and the Urge to Smoke Scale in female and male smokers, and hypothesized that women would show stronger responses to initiating abstinence from smoking. Thirty men and 21 women, who met criteria for nicotine-dependence and were 18 to 55 years old, participated in tests on two separate days. Self-reports were collected on one day after ad libitum smoking (< 15-60 min since last cigarette); and on the other day after overnight abstinence (> 13 h since last cigarette). Each test day included two test blocks with an intervening break, during which the participants each smoked one cigarette (regular brand). Compared with the male smokers, the women had higher self-reports of tension-anxiety, anger-hostility, cigarette craving, and other psychological symptoms of nicotine withdrawal in the first test of the day that followed overnight abstinence than on the corresponding test on the day of ad libitum smoking. In addition, the women also showed a greater relief from these negative affective states and nicotine withdrawal after smoking a cigarette following overnight abstinence. These findings suggest that a greater degree of negative affects reported by the women relative to the male smokers, after abrupt abstinence, and relief from these states after smoking a cigarette, may contribute to greater difficulty of smoking cessation and the likelihood of relapse.

### **ESTRADIOL MODULATION OF D-AMPHETAMINE IN PREMENOPAUSAL WOMEN: A DOSE-RESPONSE STUDY**

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Previous research has demonstrated that d-amphetamine alters mood and psychomotor behavior in humans. There is also evidence that estrogen modulates the effects of dopaminergic drugs, such as d-amphetamine, in women. This ongoing study explores the physiological and behavioral effects of d-amphetamine, alone and in combination with estradiol, in healthy, premenopausal women. Volunteers complete 13 experimental sessions during the early follicular phase of their menstrual cycle when endogenous estradiol levels are low, and are administered estradiol (0, 0.25, 1 or 2 mg, sublingual) and d-amphetamine (0, 5 or 15mg/kg mg, p.o.) in combination under double-blind, double-dummy conditions. Prior to (baseline) and subsequent to (1, 2, 3 hours), drug administration, volunteers complete assessments consisting of cardiovascular measures, verbal reports of drug effect (Visual Analog Scales and the Profile of Mood States), as well as computer tasks designed to assess psychomotor (Digit Symbol Substitution Task) and impulsive (Balloon Analog Risk Task, Delay Discounting and Stop-Signal) behavior. The effects of these two compounds, alone and in combination, will be analyzed using a repeated measures ANOVA with amphetamine dose, estradiol dose and time as factors. Thus far, 5 of 10 subjects have completed the study. Typical stimulant-like effects of d-amphetamine have been observed on all measures, including significant increases in heart rate and blood pressure, as well as verbal reports of stimulated, rush, and arousal. In contrast, estradiol alone has not engendered any significant effects. It is hypothesized that estradiol will significantly increase the magnitude of the stimulant effects of d-amphetamine. Supported by RR-15592.

### **CORRELATES AND GENDER DIFFERENCES OF CHRONIC PAIN PATIENTS USING PRESCRIPTION OPIATES: A PILOT STUDY**

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Recent reports indicate that prescription opiate misuse is on the rise (Gordon, 2001). Emergency Department visits related to prescription narcotic analgesics increased 117% from 1994 to 2001 (Crane, 2003). A better understanding of factors related to prescription opiate misuse is critical in designing effective prevention and treatment interventions. The current pilot study examines the characteristics, correlates and gender differences of treatment-seeking chronic pain outpatients using prescription opioid medications. To date, 35 individuals (22 women, 13 men) receiving treatment at the MUSC's Pain Clinic have completed the study. Participants completed measures assessing demographic information, opioid medication misuse, alcohol and other substance use, pain severity, treatment satisfaction, and Axis I symptomatology. Preliminary findings revealed that men were more likely than women to suspect that they were dependent on their pain medication ( $p=.02$ ). Women were more likely than men to report saving unused pain medication ( $p=.03$ ) and to report experiencing more severe pain ( $p=.08$ ). Significantly more women endorsed past month symptoms consistent with somatization disorders ( $p=.05$ ) and more men endorsed past month symptoms of drug abuse ( $p=.04$ ). Level of substance use was associated with lower rates of perceived effectiveness of and satisfaction with pain reduction interventions, less support from friends and family, and attitudes endorsing the belief that a greater percentage of pain patients misuse pain medications ( $p<.05$ ). Recruitment is on-going and the findings presented will report on the full sample.

### **GENDER AS A MODERATOR IN THE RELATIONSHIP BETWEEN BEHAVIORAL MEASURES OF RISK-TAKING AND IMPULSIVITY IN A SAMPLE OF INNER-CITY, AFRICAN-AMERICAN SUBSTANCE USERS**

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The Balloon Analogue Risk Task (BART) is a behavioral measure of risk-taking, in which participants weigh potential gains against potential losses. The BART has been highly correlated with real world risk taking behaviors, such as regular smoking, alcohol abuse, polysubstance use, and gambling, as well as an aggregate of non-addictive risks, including unsafe sexual intercourse, infrequent seat belt use, and stealing. In all studies to date, the BART has not been significantly related to other behavioral measures of impulsivity in substance users, a population in which risk-taking behavior and impulsivity are key symptom domains. Although risk-taking and impulsivity are separate constructs, the long-standing hypothesized relationship between the two warrants further study. In the current study, we administered the BART as a measure of risk taking propensity as well as the Kirby Delay Discounting Task and the Logan Stop Go Task as measures of impulsivity in a sample of inner-city, African-American substance users enrolled in an inpatient treatment facility. Consistent with past research, there was no relationship between the BART, the Kirby Delay Discounting Task, and the Logan Stop Go Task. However, when the sample was split with gender as a moderator, there was a significant positive correlation between the BART, and the Kirby Delay Discounting Task and the Logan Stop Go Task ( $r = .32, p < .05$ ) in the sample of women only.

This finding has particular relevance not only because past research in community samples failed to examine gender as a moderator, but also because previous studies specific to inner-city, African-American substance users have been primarily composed of males, precluding a similar moderator analysis. Possible reasons and implications for this gender difference are explored, as well as the need for future research to elucidate gender differences in the relationship between risk taking and impulsivity.

#### **EFFECT OF TASK DIFFICULTY ON A MORRIS WATER MAZE REVERSAL TASK IN RATS PRENATALLY EXPOSED TO TOLUENE**

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While drug abuse rates have decreased over the past several years, abuse of inhalants remains unchanged. To date, there are no studies assessing cognition of offspring after maternal toluene abuse. In this preclinical study, timed-pregnant Sprague Dawley rats were exposed from Gestation Day 8 (GD8) to GD20 to 8,000 or 12,000 parts per million (ppm) toluene, or 0 ppm (controls). Beginning on Postnatal Day 70 (PD70), offspring were trained in a Morris Water Maze for 3 trials/day for 5 consecutive days. Task difficulty was manipulated by placing rats on the platform after every trial (easy task) or placing them on the platform only once, after the last trial on the first day of acquisition (hard task). Prior to acquisition trials on day 5, rats were given a 10-sec probe trial. Twelve days later, rats were given a 10-sec recall trial, followed by a 3-trial reversal task with the goal placed in the opposite quadrant. There were no differences in latencies to find the platform during acquisition regardless of prenatal toluene condition or task difficulty. For the easy task, control animals spent significantly more time during the probe trial in the goal quadrant than in any other quadrant. In contrast, toluene-exposed rats trained with the easy task spent equal time in all 4 quadrants suggesting that a different, non-spatial strategy was being used by these animals than that used by controls. These toluene-exposed animals also took longer to find the platform during the reversal learning task. After training in the hard task, the probe and recall trials failed to exhibit any differences in strategy as a function of prenatal toluene exposure, as all animals spent equivalent time in all quadrants. Further, there were no differences in latency to locate the hidden platform during acquisition or reversal for animals in the hard task. These findings suggest that prenatal exposure to toluene may induce cognitive deficits that are sensitive to task difficulty. (Supported by grants DA15095 and DA015951 to SEB).

#### **GENDER AND THE PREVALENCE AND CORRELATES OF SUBSTANCE USE DISORDERS AMONG 12-21 YEAR-OLDS IN THE US**

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Hypothesis: Addictive disorders often begin during youth. We hypothesize that, as a result of limited access, youths will be more likely to exhibit abuse/dependence on individual drugs [mono-substance use disorder (SUD)] than multi-SUD. In addition, boys and girls will have different variables associated with SUD. Procedures: We pooled data from the 2003-2005 National Surveys on Drug Use and Health, annual surveys of U.S. households. SUDs were assessed using DSM-IV abuse/dependence criteria. We analyzed patterns of SUD among 12-21 year olds, focusing on gender differences. Analysis: Bivariate analyses of mono- vs. multi-SUD patterns between boys and girls. Independent logistic regression models were run with SUDs as the dependent variable. Results: Of 83,771 respondents 12-21 years of age, 49% were girls, 62% white, 15% black, 17% Hispanic, and 7% other. Mono-SUDs were more common than multi-SUDs (11% vs. 4%,  $p < .001$ ). The prevalence of mono-SUDs was 7.1% for alcohol, 2.2% for marijuana, and .4% for prescription opioids. Among respondents with alcohol, marijuana, and prescription opioid SUDs, 67% (5,764/8,556), 42% (1,840/4,340), and 31% (318/1,090), had no other SUD, respectively. Boys were more likely to have mono-SUD of alcohol (7.7% vs. 6.4%,  $p < .001$ ) and marijuana (2.7% vs. 1.7%,  $p < .001$ ); whereas girls were more likely to have mono-SUD of prescription opioids (.5% vs. .3%,  $p = .002$ ). On logistic regression, male gender was independently associated with both marijuana-only SUD (AOR 1.6, 95% CI 1.4-1.9) and alcohol-only SUD (AOR 1.2, 95% CI 1.1-1.3). Female gender was independently associated with prescription opioid-only SUD (AOR 1.6, 95% CI 1.2-2.2). Conclusions: Mono-SUDs are more common than poly-SUDs among those 12-21 years of age in the U.S. The prevalence of these disorders varies by gender and by substance. Boys are at greater risk for mono-SUD of alcohol and marijuana whereas girls are at greater risk for mono-SUD of prescription opioids. These findings should inform current screening and treatment initiatives among this population.

### **GENDER DIFFERENCES IN SEX RISKS AMONG UKRAINE INJECTION DRUG USERS**

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Background: As many as 500,000 Ukrainians may be HIV infected, or more than 1% of the adult population, fueled largely by injection drug use (IDU). Epidemiological data indicates the epidemic is expanding to the general population through heterosexual intercourse. The purpose of this paper is to assess gender differences in sex risks among IDUs from three Ukraine sites, Kiev, Odessa and Makeevka/Donesk. Methods: From June 2004 through November 2006, 1557 IDUs were recruited, including 526 from Kiev, 494 from Odessa and 537 from Donesk, by ex-drug users serving as outreach workers. Participants were required to show signs of recent injection. If determined eligible, following informed consent, a computer audio-assisted structured interview was conducted and HIV serology testing performed. Results: Overall, 35% tested positive for HIV, including 34% in Kiev, 52% in Odessa and 18% in Makeevka/Donesk. Participants averaged 29 years of age, they had been injecting for approximately 10 years and 24% were female. Males were significantly more likely to report multiple sex partners, while females were more likely to have an IDU sex partner or an HIV infected sex partner. In a multiple logistic regression, unprotected vaginal or anal sex was associated with being married, injecting stimulants, injecting with others, injecting with a collectively prepared drug solution and not being told they were HIV infected. Having multiple sex partners was associated with younger age, being male and single, having had a sexually transmitted disease (STD) and not being told they were HIV infected. Sex with an HIV infected partner or a partner whose HIV status was unknown was associated with being single, a past STD, having been told they were HIV infected and a perception of not being a safe injector. Conclusions: The strong overlap between sex and injection related risk behaviors, coupled with the high rate HIV positive tests, portends of an expansion of the HIV epidemic in Ukraine. Supported by the National Institute on Drug Abuse DA017620.

### **THE EFFECT OF PLASMA PROTEINS ON BUPRENORPHINE TRANSFER ACROSS HUMAN PLACENTAS**

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Buprenorphine (BUP) is an alternative to methadone for the pharmacotherapy of the pregnant opiate dependent patient. Previously, we reported that the free/unbound BUP is retained and accumulated by term placental tissue and consequently its transplacental transfer to the fetal circuit of the dually perfused placental lobule (DPPL) was low. Therefore, the goal of this investigation is to determine the role of human serum albumin (HSA) and  $\alpha$ -acid glycoprotein ( $\alpha$ -acid GP) on placental transfer and distribution of BUP. This goal was achieved by utilizing the technique of dual perfusion of placental lobule (DPPL) in its recirculating configuration (closed-closed). The effect of physiological concentrations of HSA (30 mg/ml added to both the maternal and fetal circuits) alone, and in combination with  $\alpha$ -acid GP (0.6 mg/ml in the maternal circuit and 0.24 mg/ml in the fetal circuit) on the transfer of BUP was investigated. In term placentas (GA >38 weeks), the transfer and distribution of BUP in the absence of plasma proteins was set at 100%. In the presence of HSA and  $\alpha$ -acid GP, a pronounced effect on the transfer and distribution of BUP was observed. The amount of BUP in the maternal circuit was increased by 45%, whereas the concentration of BUP in the placental tissue was reduced by 25%. Moreover, the amount of BUP transferred to the fetal circuit was increased by 45%. However, the structure and functions of human placenta changes during gestation thus could affect the transfer of BUP to the fetal circulation. In preterm placentas (GA  $32.6 \pm 1.7$  weeks) and in absence of plasma proteins, the transfer of BUP and its distribution across preterm placentas did not differ from that of term placentas. Currently, the effect of physiological concentrations of HSA and  $\alpha$ -acid GP on the transfer and distribution of BUP in preterm placentas is under investigation. In conclusion, term placental transfer of BUP and its distribution is affected by the binding of the opiate to HSA and  $\alpha$ -acid glycoprotein. Supported by a grant from NIDA (DA 13431) to MSA.

### **THE ROLE OF LOCUS-OF-CONTROL IN FEMALE CRACK/COCAINE USERS**

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Research on locus-of-control (LOC) has shown that behavior-specific scales were more predictive than generalized measures. Alcoholism, depression, sociopathy and poor treatment outcome have been associated with external LOC and prior alcoholism treatment with internal LOC. Oswald (1994) demonstrated a similar pattern in mostly male, in-treatment cocaine users using a cocaine-related scale (CRIE). The CRIE is 25 forced-choice paired-items modified for cocaine use from the drinking scale: e.g. internal: I can overcome my urge to use cocaine. vs. external: Once I start to use cocaine I can't stop. The CRIE score is the count of external LOC statements selected. This analysis examines LOC using the CRIE in a large sample (N=464) of predominately African-American (89%) women recruited by street outreach for a NIDA-funded HIV prevention study (DA11622). The women were 18-67 years of age (mean  $38.6 \pm 6.7$ ), 56% completed high school or GED, 30% were active sex traders and 36% met



DSM-IV diagnostic criteria for depression. All reported lifetime crack or cocaine use; 59% of users met DSM-IV diagnostic criteria for cocaine dependence; and 19% were self-reported IDUs. The mean CRIE score was  $7.7 \pm 4.3$ ; 14% (N=66) endorsed 13 or more external LOC items and 86% endorsed 12 or less. External LOC in this sample was associated with, cocaine dependence, depression and antisocial behaviors as smaller, mostly male studies suggest. Women with external LOC were more likely to be active sex traders ( $\chi^2=28.2$ ;  $p<.0001$ ), IDUs ( $\chi^2=5.6$ ;  $p<.05$ ), raped before age 15 ( $\chi^2=5.3$ ;  $p<.05$ ) and to report prior alcohol or drug treatment ( $\chi^2=6.8$ ;  $p<.01$ ). This analysis shows the majority of crack-using women have an internal LOC and those with external LOC are more likely to have comorbid problems. An important aspect of this work is whether LOC can predict a later reduction in drug use.

#### **GENDER DIFFERENCES IN RESPONSE TO STRESS AND CUES IN COCAINE-DEPENDENT INDIVIDUALS**

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There is a growing interest in gender differences in factors influencing initiation, maintenance and relapse to drug use. In this study, subjective and HPA axis (e.g., ACTH, cortisol) response to cocaine-related cues, a psychological stress task (Trier Social Speaking Task; TSST) and CRH stimulation were compared in cocaine-dependent men and women and a matched control group. Ninety-two subjects have completed the protocol. Cocaine groups experienced higher stress ( $p=0.04$ ) and craving ( $p<0.0002$ ) after cocaine cue exposure as compared to the control groups. There was no gender difference in craving or stress response to cocaine cues. Cocaine-dependent men have a trend for greater peak change ACTH response following cue as compared to women ( $p=0.07$ ); no gender difference was observed for cortisol following cue presentation. All groups had increased stress ratings after the TSST, but only the cocaine groups reported craving following the TSST ( $p<.0002$ ). The Mann-Whitney-Wilcoxon test was performed to examine gender differences in peak change in subjective responses to TSST. Cocaine-dependent women experienced more stress ( $p=0.06$ ) and more craving ( $p=0.08$ ) following the TSST than cocaine-dependent men. There was significantly higher craving after exposure to cocaine cues as compared to the TSST (median difference 1.5,  $p=0.02$ ) for men but not women. No gender differences in peak change ACTH or cortisol were found following TSST. Both cocaine groups experienced higher craving after CRH infusion as compared to the control groups ( $p=.0002$ ). These data suggest a greater response to a psychological stressor for cocaine-dependent women and significantly higher craving to cocaine cues for men. In addition, cocaine-dependent individuals had a greater subjective response to CRH than the control group suggesting a sensitivity to a pharmacological stressor. These findings may help inform gender-specific treatment approaches in cocaine-dependent individuals.

#### **DISPARITIES IN HEALTH SERVICES FOR ADDICTION-RELATED INFECTIONS IN SUBSTANCE ABUSE TREATMENT PROGRAMS**

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The availability of infection-related health services in treatment programs serving women and non-white populations has not been investigated despite the proven infection-related benefits of substance abuse treatment. We investigated the differences in availability of infection-related services between programs with and without addiction services tailored for women and non-white populations. In a cross-sectional, descriptive design, administrators from 269 treatment programs within the National Drug Abuse Treatment Clinical Trials Network provided program characteristics, availability of 21 infection-related services, and presence or absence of 8 barriers to providing these services. Compared to treatment programs without addiction services tailored for any special population, treatment programs providing addiction services designed for at least one special population were more likely to provide HIV-related education (94% versus 85%,  $p = 0.05$ ) and patient counseling (76% versus 60%,  $p = 0.03$ ), and were more likely to include outpatient addiction services (86% versus 57%,  $p<0.001$ ) and outreach and support services (92% versus 70%,  $p=0.01$ ) despite funding, health insurance, and patient acceptance barriers. Tailoring addiction treatment and reducing barriers to infection-related health care provide opportunities to reduce the burdens and disparities associated with these infections.

### **METHADONE IN PREGNANCY: TREATMENT RETENTION AND NEONATAL OUTCOMES**

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**Aim:** To examine the association between retention in methadone treatment during pregnancy and key neonatal outcomes. **Design:** Linked administrative population health data from 1992 to 2002 was analysed to examine whether increased time in methadone treatment prior to delivery was associated with improved neonatal outcomes. **Measurements:** Obstetric and perinatal characteristics of women who were retained continuously on methadone maintenance throughout their pregnancy were compared to those who entered late in their pregnancies (less than six months prior to birth) and those whose last treatment episode ended at least one year prior to birth. **Findings:** There were 2,993 births to women recorded as being on methadone at delivery, increasing from 62 in 1992 to 459 births in 2002. Compared to mothers who were maintained continuously on methadone throughout their pregnancy, those who entered treatment late also presented later to antenatal services, were more likely to arrive at hospital for delivery unbooked, were more often unmarried, indigenous, and smoked more heavily. A higher proportion of neonates born to late entrants were born at less than 37 weeks gestation and were admitted to special care nursery more often. **Conclusion:** Continuous methadone treatment during pregnancy is associated with earlier antenatal care and improved neonatal outcomes. Innovative techniques for early engagement in methadone treatment by pregnant heroin using women or those planning to become pregnant should be identified and implemented.

### **THE IMPACT OF PARENT GENDER ON PREDICTORS OF PRESCHOOL PROBLEMS IN SUBSTANCE-ABUSING FAMILIES**

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Parent psychopathology and parenting are robust predictors of internalizing and externalizing problems among preschool children. However, no studies have examined the unique contribution of these predictors in substance-abusing families. Further, no studies have examined whether these relations differ for substance-abusing mothers and fathers. Participants included 171 parents ( $n = 105$  mothers ;  $n = 66$  fathers) receiving treatment for substance dependence who took part in a larger study of the effects of substance abuse on a range of child outcomes. Parents completed measures including the Brief Symptom Inventory (Derogatis, 1993; BSI), the Parenting Scale (Arnold et al., 1993; PS), and the Child Behavior Checklist (Achenbach & Rescorla, 2001; CBCL). The Parent Psychological Distress, Laxness, Overreactivity, and Verbosity manifest variables consisted of scores on the BSI GSI and subscales of the PS. Child outcome variables were the CBCL Internalizing and Externalizing broad-band syndromes. Multiple group structural equation modeling was used to estimate a series of nested models. Results showed that 7 of 8 predictor paths could be constrained to be identical across parent gender without worsening the model fit. The Constrained Model fit the data well ( $\chi^2(66)=88.20, p=.035; TLI=.932; RMSEA=.045$ ), and did not differ significantly from the Unconstrained Model, ( $\chi^2(7)=8.7, p>.05$ ). Results indicated that parent overreactivity independently predicts child internalizing and externalizing problems among both substance-abusing mothers and fathers. Further, paternal psychological distress uniquely predicts child externalizing problems. In contrast, maternal psychological distress predicts both child internalizing and externalizing problems. Findings suggest that prevention/intervention efforts with preschool-age children should include both substance-abusing mothers and fathers. Supported by NIDA DA10821, DA 016609-04, and F31DA017999.

### **MENSTRUAL PHASE EFFECTS ON SMOKING CESSATION: A PILOT FEASIBILITY STUDY**

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A growing but mixed body of research suggests that the premenstrual, i.e., luteal phase of the menstrual cycle may be associated with increases in nicotine withdrawal and cigarette craving. This suggests the need for focused cessation treatment during the luteal phase and/or quit attempts that are well timed relative to specific menstrual phases. In this pilot feasibility study, we randomized 45 adult daily female smokers ages 18-40 who were not currently using hormonal contraception to quit smoking during either the follicular or luteal phase of their menstrual cycle. The luteal phase ( $n=20$ ) was verified via a self-monitoring kit (Clearblue Easy® Fertility Monitor), and the follicular phase ( $n=25$ ) was verified by self-report in conjunction with sham hormonal testing to equate for monitoring procedures. Participants were provided with two sessions of smoking cessation counseling (90min total), one prior and one post target quit date. Additionally, all participants were provided with transdermal nicotine patch contingent upon maintenance of abstinence throughout the course of the six week study. Using an intent-to-treat analysis, CO-verified 7-day point prevalence abstinence rates at 1, 2, 4, and 6 weeks following the target quit date were 28% vs. 25%, 32% vs. 20%, 12% vs. 15%, and 8% vs. 10%, for follicular vs. luteal groups, respectively (all n.s.). Among those who initiated treatment, received patch, and made a quit attempt ( $n=35$ ), 1, 2, 4

and 6-week quit rates were 37% vs. 31%, 42% vs. 25%, 16% vs. 19%, and 11% vs. 13%, for follicular vs. luteal groups, respectively (all n.s.). These preliminary data suggest that initial success (i.e., within two weeks of a quit attempt) may be greater when women quit smoking in the follicular phase of their cycle. If supported by future, larger studies, these data may inform decision-making about treatment for women smokers. Study sponsored by NIAMS, the Office of Research on Women's Health (1-P50-DA-16511-03), and MUSC.

#### **MALE-FEMALE AND BETWEEN-COUNTRY DIFFERENCES IN TOBACCO DEPENDENCE DIAGNOSTIC ASSESSMENTS: COLOMBIA AND UNITED STATES**

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**QUESTION:** A common convention in tobacco dependence research is to assume comparable functioning of diagnostic assessment items for subgroups (e.g., males v females, M v F). Here, we use item response theory (IRT) to estimate item-level 'discrimination' ( $\lambda$ ), 'difficulty' ( $\tau$ ), and information (I- $\theta$ ) parameters for M & F smokers in two countries. **METHODS:** Data are from national community surveys in Colombia & the US, with the same diagnostic protocols to identify those smoking tobacco daily for 2+ months (Colombia daily smokers: n=337 F, 464 M; US: n=1656 F, 1437 M), and to assess nicotine dependence via 7 standardized interview items. IRT software in R was from D. Rizopoulos. **RESULTS:** Noteworthy M-F similarities surfaced in both countries, especially in US, where no  $\lambda$ ,  $\tau$ , or I- $\theta$  estimates differed appreciably across the two sexes. For both sexes in both places, an especially difficult item (i.e., large  $\tau$ ) was 'give up important activities to smoke' (all four  $\tau > 1.85$ ;  $p < 0.05$ ), while 'persistent desire or unsuccessful efforts to cut down or control smoking' was discriminating in all subgroups under study (i.e., large  $\lambda$ , with all four  $\lambda > 2.1$ ;  $p < 0.05$ ). M and F  $\lambda$  and  $\tau$  estimates were similar in Colombia, but item-level information (I- $\theta$ ) estimates differed. For example, among female smokers the sole large I- $\theta$  value was seen for the 'more than intended' item, whereas for males, equally large I- $\theta$  values were observed for the items on 'give up important activities' and 'continued smoking despite problems'. **CONCLUSION:** These 'item-metric' results are especially supportive of within-country research on male-female differences. Nonetheless, the observed between-country variation in item functioning must be probed more deeply before firm conclusions are based upon cross-national survey evidence about tobacco dependence. **ACKNOWLEDGMENTS:** NIDA Awards R01DA016558 & K05DA015799 & see WMH web site.

#### **STUDY ON DRUG USE, SEX BEHAVIORS, USE OF CONDOMS AND HIV RISK AMONG IDUS IN TEKU**

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**Background:** Elevated rates of HIV infection among IDUs in Teku, Nepal have been reported by some studies. The objectives of this study were: (1) To assess the scope and characteristics of drug abuse among the residents of the study area; (2) To explore the gender differences in HIV status; (3) To see, if elevated rates of needles sharing were associated with HIV positive among a cohort of IDUs. **Methods:** IDUs (n=240) aged 15-25 in Teku area were administered a structured survey questionnaire from July 15, 2006 to October 15, 2006. Baseline surveys collected data on HIV infection rate, types of drug and alcohol use, demographic, sexual behavior, condom use, depression and readiness to quit drug use. The participants completed a questionnaire which was carried out using the Street Intercept method. Chi-square tests and logistic regression were used to determine associations between the above factors and needle sharing within the last one year. **Results:** Among the 240 participants, 95 percent were male, 5 percent female. Most of them were heroin injectors (60 percent). Among the heroin injectors 40 percent share needles. Prior to base line of 2 months, 20 percent had >2 sex partners, 10 percent of them had casual sex partners. While only 18 percent of them use condom. The study showed high prevalence of unsafe sex. A total of 24 (10 percent) of the 240 IDUs in the study were found to be HIV-positive. All of them shared needles. Among them 8.33 percent (20 persons) were male and 1.66 percent (4 persons) female. So significant gender associated differences were found having high prevalence of HIV among males and high number of male drug abusers (95 percent). Also 95 percent of the 240 participants were in depression, 60 percent were unwilling or unable to quit drugs, 65 percent used alcohol, 60 percent used marijuana and 17 percent used heroin. **Conclusions:** Persons struggling with drug abuse and HIV infection in Teku have been unnoticed or underserved to HIV treatment. In order to lower the risk of HIV transmission among young people, drug treatment policies should be improved and educational and intervention programs should be carried out.

#### **TIME TO REMISSION FROM ALCOHOL, NICOTINE, AND ILLEGAL DRUG DEPENDENCE IN THE U.S.**

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**Background:** Little is known about the natural course of remission of drug dependence. Filling this gap can help guide the development of effective drug dependence interventions. **Objective:** To compare likelihood of remission from drug dependence across types of drugs and demographic characteristics, prior drug involvement and history

of psychiatric disorders. Methods: Retrospective data from the National Epidemiologic Survey of Alcohol and Related Conditions (NESARC) were analyzed using survival analysis to estimate time to remission among 4422, 6993, and 1149 respondents with a history of alcohol, nicotine, or illegal drug dependence, respectively. Remission was defined as having no current symptoms of abuse/dependence (general remission). For alcohol, alternative definitions of remission included safe drinking and abstinence. Results: Median time to general remission was lower for illegal drugs (5 y) versus alcohol (14 y) and nicotine (30 y). Likelihood of alcohol remission varied by definition: After 20 years, probability of abstinence was 0.21 versus 0.58 for general remission. Early onset, being single, and current smoking signaled less remission for all drugs. History of psychiatric disorders and other drug dependence were weakly associated with general remission for all drugs. There was higher likelihood of remission for those with high vs. low SES for general alcohol, nicotine and illegal drug dependence. In contrast, high SES signaled lower likelihood of alcohol abstinence -- those with a master's degree were half as likely to abstain than those who did not finish high school (hazard ratio = 0.43, 95%CI = 0.29-0.64). Conclusion: Remission from drug dependence varies considerably by type of drug and definition of remission, as well as by respondent characteristics, such as SES and age of dependence onset. Epidemiologic data can shed light on the natural history of drug dependence in order to guide clinical trial planning and strategies for providing services to treat drug dependence.

#### **EFFECTS OF ACUTE PSYCHOLOGICAL STRESS UPON ALLOPREGNANOLONE**

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Psychological stress plays an important role in the development of psychopathologies, including substance dependence. Acute stress produces a cascade of physiological, psychological and hormonal effects, each of which may directly interact with and alter the physiological and/or subjective effects of drugs. Recent evidence indicates a role of neuroactive steroids, in particular allopregnanolone (a potent positive allosteric modulator of GABAA receptor function), in the regulation of physiological and subjective responses to stress. The present study characterized changes in plasma allopregnanolone after an acute psychological stressor in male smokers and non-smokers, and in female non-smokers in two phases of the menstrual cycle. Volunteers (N=74) participated in two sessions, one with stress and the other without stress. Heart rate, blood pressure, subjective ratings and plasma hormones including allopregnanolone were measured before and at repeated times during each condition. Baseline and stress-induced levels of allopregnanolone differed between the groups. Female volunteers tested in the luteal phase exhibited higher levels than both females tested in the follicular phase and male non-smokers. In addition, male smokers exhibited lower baseline levels of allopregnanolone than male non-smokers. Compared to the control condition, stress significantly increased levels of allopregnanolone in females tested in the luteal phase. In females tested in the follicular phase there was a trend to lower levels of allopregnanolone after stress. Stress did not significantly affect levels of allopregnanolone in males. These findings indicate that acute stress alters plasma levels of allopregnanolone in humans as it does in animals, and this effect is most pronounced in women. Given the links between acute stress and drug use, it follows that sex differences in hormonal responses to acute stress may be related to sex differences in vulnerability to use drugs. Changes in allopregnanolone will be examined in relation to other physiological, subjective, and hormonal measures, including progesterone. This research was supported by DA02812 and M01RR00055.

#### **SCREENING FOR COMORBID MOOD DISORDER AMONG PREGNANT SUBSTANCE-DEPENDENT PATIENTS: CHARACTERISTICS OF THE ADDICTION SEVERITY INDEX AND BECK DEPRESSION INVENTORY**

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Introduction: Accurate tools to quickly assess the need for psychiatric referral early in substance abuse treatment are needed. Pregnant women with substance use may particularly need rapid evaluation and psychiatric intervention to maximize positive pregnancy outcomes. This study determined the test characteristics of the Addiction Severity Index (ASI) psychiatric interviewer severity score (ISS) and the Beck Depression Inventory (BDI) when used as screening tests for current mood disorder in pregnant substance dependent patients. Methods: Patients (N=187) admitted to the Center for Addiction and Pregnancy (CAP) between 6/00-9/02 took part in a larger behavioral study. All subjects who completed an ASI, BDI, and Structured Clinical Interview for DSM-IV (SCID-I) were included. Receiver operating characteristic (ROC) curves were constructed for the ASI psychiatric ISS and the BDI total score as predictors of current mood disorder. Tables of sensitivities and specificities were created for various cutoff values. Results: Women were an average of 30.1 years old, predominantly not married (89.9%), African American (71.1%), and had an average of 11.2 years of education. They had a mean ASI psychiatric status ISS of 3.2 (range 0-8), and mean BDI score of 14.9 (range 0-47). 51 women (27.3%) were diagnosed with current mood disorder. The areas under the ROC curves were 0.73 for the ASI psychiatric ISS ( $p < 0.001$ ) and 0.59 for the BDI ( $p = 0.065$ ). Using the sum of sensitivity plus specificity to determine the minimal cutoff value for detection of a case as defined by the SCID, scores were determined to be 18.5 for the BDI and 4.5

on the ASI psychiatric ISS. Conclusions: The ASI and BDI can serve as rapid screening tests for current mood disorder in pregnant substance dependent patients. The ASI psychiatric ISS performed better than the BDI in these analyses. Detection levels for cases of current mood disorders with each instrument appear to vary from those used for more general populations of patients.

**INDIVIDUAL DIFFERENCES TO NALOXONE VS. PLACEBO IN OPIOID-DEPENDENT HUMANS RESPONDING UNDER A NALOXONE DISCRIMINATION PROCEDURE: INFLUENCE OF SEX AND METHADONE MAINTENANCE DOSE**

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Self report data from 32 male and 15 female methadone-maintained volunteers were examined for individual differences in response to naloxone (0.15 mg/70 Kg, IM) and placebo at 20 and 40 minutes post injection. After dividing males and females by low or high methadone maintenance doses (mg/kg body weight), drug x sex x methadone dose x time interactions were found on the VAS ratings of bad effects and on the Antagonist and Mixed- Action Opioid subscales of the Adjective Rating Scale (ARS; all  $p < 0.05$ ). Post-hoc analyses revealed that only female subjects on lower methadone-maintenance doses experienced significantly greater responses to naloxone relative to placebo on the VAS Bad effects ( $p < 0.01$ ), the Antagonist ( $p = 0.05$ ) and Mixed-Action Opioid ( $p = 0.01$ ) subscales at 20 min post injection compared to female subjects on higher methadone doses. No significant differences were noticed for the male participants in either dose group at either time point. Female subjects on the lower methadone maintenance dose also showed a trend toward significant placebo-induced increases in ratings on the Agonist subscale of the ARS relative to naloxone at 20 min post injection ( $p = 0.06$ ); whereas females on the higher maintenance doses and males did not. The results suggest that females on lower methadone maintenance doses are more sensitive to the effects of naloxone than those on higher doses or males on methadone maintenance, regardless of dose. (Supported by NIDA grant DA10017 and Arkansas Biosciences Institute, the major research component of the Tobacco Settlement Proceeds Act of 2000).

**GENDER DIFFERENCES IN THE RELATIONSHIP OF PEER INFLUENCE AND BELIEFS TO ADOLESCENT SUBSTANCE USE IN A RURAL STATE**

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Background: Adolescent alcohol and drug use has been attributed to peer influence and perception of risk, but few studies have examined the roles peer influence and beliefs play in substance use among rural adolescents. Method: A total of 1,607 adolescents age 12 to 17 were interviewed using a random digit dialing telephone survey of Kentucky households. Participants were asked how many of their three closest friends used alcohol or other drugs in the past 30 days and if they thought they would be seen as cool by their peers if they smoked cigarettes, drank alcohol, or smoked marijuana. Data were stratified by gender and age-adjusted relative risk estimates were calculated using the Mantel-Haenszel method. Results: Relative risk for cigarette, alcohol, and marijuana use was positively correlated with subject perception of peer approval for both genders. When compared to females, males had a higher relative risk of smoking cigarettes if they perceived they would be seen as cool (RR = 3.0 vs. 1.9), but a lower relative risk of smoking marijuana if they perceived they would be seen as cool (RR=4.2 vs. 5.7). No gender differences were found for drinking, both genders were 2.2 times more likely to drink if they perceived they would be seen as cool. Adolescents were more likely to use alcohol or drugs in the past month if 3 of their 3 closest friends also used alcohol or drugs in the past month. Males with 3 of their 3 closest friends who drank in the past month were 21.9 times more likely (24.1 for females) to have drunk in the past month compared to males (females) with no close friends who drank. Males with 3 of 3 close friends who used drugs in the past month were 54.7 times more likely (42.7 times for females) to also use drugs in the past month compared to male (female) adolescents with no close friends. Implications: Practitioners and prevention planners may wish to explore peer influence and beliefs when addressing adolescent substance use in rural populations while taking into account how they may differentially affect males and females.

**HIV RISK BEHAVIORS AMONG FEMALE IDUS IN DEVELOPING AND TRANSITIONAL COUNTRIES**

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Background: In many studies, female injecting drug users (IDUs) have been found to engage in more risk behavior than male IDUs. Most data on gender differences come from industrialized countries, however, with relatively little data are needed in developing countries. In particular, there is relatively little data on situational contexts that may influence risk behavior among female IDUs in developing countries. Methods: Between 1999 and 2003, 2512 male and 672 female current injection drug users (IDUs) were surveyed in ten sites in developing countries around the world (Nairobi, Beijing, Hanoi, Kharkiv, Minsk, St. Petersburg, Bogota, Gran Rosario, Rio, and Santos). The survey included a variety of questions about demographics, injecting practices and sexual behavior. Results:

Females were more likely to engage in risk behaviors in the context of a sexual relationship with a primary partner while males were more likely to engage in risk behaviors in the context of close friendships and casual sexual relationships. After controlling for injection frequency, and years injecting, these gender differences were fairly consistent across sites. Conclusions: Gender differences in risk depend on the relational contexts in which risk behaviors occur. The fact that female and male risk behavior often occurs in different relational contexts suggests that prevention interventions which are sensitive to these contexts may be necessary in developing and transitional countries.

#### **STABILITY IN RELIGIOUS COPING AMONG METHADONE MAINTENANCE TREATMENT PATIENTS, AND GENDER DIFFERENCES**

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Background: In contrast to literature, we previously found negative relation between religious coping and drug abuse abstinence in MMT patients. Aims: to determine whether religious coping (defined as strategies through which religion involves in the coping process) (RCOPE) would be stable or change following 1.5 years in MMT patients, and whether it would be related to drug abuse status and gender. Methods: We re-evaluated 82 consecutive patients studied between December-2004 and July-2005. Patients filled RCOPE questionnaires. Drugs abuse defined if at least one urine during 3 month before questionnaire was positive. Results: Of 82 patients, 24(29.6%) were females. Thirty-three (40.2%) always" abused any drug (in both 1st and 2nd questionnaires), 21 (25.6%) "never" abused, 17 (20.7%) "stopped" (abused in 1st questionnaires), and 11(13.4%) "started" (abused in 2nd questionnaires). Religious coping strategies were found stable between the 2 evaluations (following mean duration of  $1.5 \pm 0.2y$ ) i.e.: self direction religious coping (paired t-test:  $2.81 \pm 1.5$  vs.  $2.79 \pm 1.4$ ,  $t=0.1$ ,  $p=0.9$ ). Comparing time effect and drug abuse groups (Repeated measured), most strategies showed no differences by drug groups, except religious acceptance and good deeds that showed higher scores in patients who started abusing drugs compared to never, ever, and stopped groups. Females had higher RCOPE scores than males: seeking religious direction ( $F=8.7$ ,  $p=0.004$ ), spiritual discontent ( $F=14.6$ ,  $p<0.0005$ ), religious purification ( $F=4.4$ ,  $p=0.04$ ), pleading for direct intercession ( $F=17.1$ ,  $p<0.0005$ ) and religious forgiving ( $F=11.6$ ,  $p=0.001$ ). Conclusions: Religious coping usage was found as stable over time and independent of drug abuse status and gender. Females compared to male presented higher level of religious coping usage, as already found in other populations. The fact that patients who started abusing drug had higher religious coping consistent with our speculation that, these patients experienced higher distress".

#### **META-ANALYSIS OF ASSOCIATIONS OF DEPRESSION AND SUBSTANCE USE AND IMPAIRMENT IN INTRAVENOUS DRUG USERS**

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Hypotheses: 1) Positive association of depression with a) concurrent drug use and impairment, b) future drug use and impairment, c) concurrent alcohol use and impairment, d) needle sharing, and e) substance use treatment involvement. 2) The associations are moderated or greater among women and clinical (vs. community) subjects. Species: Human. Subjects: 41 studies. Procedures: Reports on IDUs published between 1986 and 2006 were reviewed based on a search of Medline and PsychINFO databases and review of reference sections. Studies were eligible if they contained assessment(s) of the association of depression and substance use or impairment or data were provided to calculate the association, and if the sampling placed no restrictions on range of depression scores. Analyses: Computations were based on random-effects models and effect sizes (d) for each study were computed by transforming correlation coefficients, t values, F values, and exact p values. Moderating effects of gender and clinical status were based on weighted multiple ordinary least squares regression analyses. Results: Hypotheses 1a, 1c, 1d, and 1e were supported, each showing a small effect size, but analyses did not support hypothesis 1b. Moderator analyses showed a greater association of depression and concurrent drug use and impairment in clinical samples and greater associations of depression with substance use treatment involvement and needle sharing among women, with these moderating effects showing large effect sizes. Conclusion: Depression is relevant to several substance-related behaviors, but an association with future drug use and impairment is unclear. Findings help illustrate the complexity of associations of depression and the outcomes that should be the focus of future studies, including to understand moderating effects of gender and clinical status.

## **EFFECTS OF PRENATAL TOLUENE EXPOSURE ON PERFORMANCE UNDER A PROGRESSIVE-RATIO REINFORCEMENT SCHEDULE**

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Toluene is one of the most abused inhalants and its abuse during pregnancy remains a world-wide public health concern. However, the neurobehavioral teratogenic effects of toluene at the high concentrations and binge-like exposure patterns typical of abuse remain understudied. In this study, a progressive-ratio schedule of reinforcement was used to determine how prenatal toluene exposure alters motivation for food in adult animals. Pregnant Sprague-Dawley rats were exposed for 30 min, twice daily, from gestational day (GD) 8 through GD20 to either air, 8,000, or 12,000 ppm toluene in a static exposure system. At postnatal day 60, male and female offspring were trained to press a lever using a fixed-ratio (FR) schedule of reinforcement. Once behavior stabilized, a progressive-ratio 5 schedule of reinforcement was introduced so that the animal received its first reinforcer after 5 responses, its second after 10, its third after 15, etc. After ~30 sessions, we compared performance response rates among the toluene exposure groups over 10 days. Repeated high-dose, prenatal toluene exposure resulted in markedly lower motivation for food reinforcers in both male and female rats compared to controls, as indicated by a significant suppression of break-points and lower response rates. Consistent with our earlier work, these results demonstrate that prenatal binge exposure to toluene can produce a motivational deficit. Supported by grants DA15095 and DA15951 to SEB.

## **WOMEN'S EMG AND SCL RESPONSE TO A STRESSOR DURING EARLY RECOVERY**

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Objective: To assess the change in women's stress response modulation over the 2nd, 3rd and 4th months of recovery. Method: A recovery group (RG) of women (n=18) was recruited from the community with M=41.4, SD=15.5 days of abstinence following use of multiple substances: alcohol (n=18), marijuana (n=11), cocaine (n=8), opiates (n=6). Over the next 3 months, the RG-Ab (n=10) used no substances and the RG-Re (n=5) used substances intermittently. Healthy women (n=15) served as a comparison group (CG). Three women were lost to follow-up from the RG. Frontalis muscle electromyogram (EMG) and skin conductance level (SCL) were measured at 3 monthly sessions, using an 18 minute protocol with 5 consecutive tasks: relaxation-paced breathing-worry-relaxation-paced breathing. The data were analyzed with repeated measures-ANOVA for main and interaction effects of group, session and task. Significant findings were followed by within-subject contrasts. Results: There was a significant main effect of task  $F(4, 24) = 3.66, p = .018$  on EMG. Values rose between the 1st paced breathing and worry, and fell between worry and the 2nd relaxation. There was a significant group by session by task interaction  $F(16, 42) = 2.15, p = .024$ . The EMG values were significantly higher at worry than at the 2nd relaxation in the RG-Ab and CG groups, but not in the RG-Re group. This task effect increased progressively from session 1 to session 3 for the RG-Ab group. The RG-Re had a dampened EMG response to the worry task, followed by little response to the 2nd relaxation task. There was a main effect of task on SCL with values rising across the protocol  $F = 4.99, p = .034$ . The SCL values were dampened throughout the protocol for the RG-Re compared with the RG-Ab and CG. Conclusions: Two possible explanations exist for the findings. The RG-Re may have had difficulty eliciting the states of worry and relaxation. Alternatively, their cognitive and emotional processes may have been poorly synchronized with their psychophysiological response.

## **THE RISE IN TREATMENT ADMISSIONS FOR METHAMPHETAMINE USE IN LOS ANGELES COUNTY FROM 2001 THROUGH 2005**

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Trends in primary drug use for Los Angeles County treatment programs were investigated. The sample was drawn from admissions to county-contracted outpatient counseling, residential treatment, and daycare habilitative programs from 2001 through 2005. The findings center on the rising number of admissions to county funded treatment programs for primary methamphetamine (MA) use, with a focus on participant gender, age, and race/ethnicity. This investigation found that the percentage of admissions to county funded treatment programs for primary MA use has substantially increased in Los Angeles County each year from 2001 through 2005. There were considerable gender differences between the participants reporting primary MA use and the participants not reporting primary MA use. Specifically, in the MA sample, there was a higher proportion of women (MA sample = 41.6% vs. non-MA sample = 35%). In the total sample (N = 79,449), female participants were more likely to report primary MA use than were male participants (30.3% of female participants vs. 24.7% of male participants). This disparity between women and men occurred over the entire 5 years as reports of MA as the primary drug at admission increased over the 5 years from 23.1% to 40.8% for females and 16.3% to 34.2% for males. Furthermore, younger participants were also more likely to be admitted to treatment for primary MA use, as

compared to other drugs, than were older participants. Participant admissions were categorized into three age groups: 18-25 years old, 26-40 years old, and over 40 years old. From 2001 through 2005, the proportion of 18- to 25-year-old participant admissions reporting primary MA use relative to other drug use increased from 31.3% to 52.8%. For 26- to 40-year-old participant admissions, the proportion rose from 20.8% to 40.5%, and for participant admissions over the age of 40, it rose from 8.2% to 17.5%. National implications of these findings, their limitations, and directions for future research are discussed.

**CHARACTERISTICS OF FEMALE METHAMPHETAMINE ADDICTS ENTERING RESIDENTIAL DRUG TREATMENT: PROGRAM IMPLICATIONS**

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The number of methamphetamine dependent women entering treatment in community treatment centers in North Texas has soared over the past five years. Nexus Recovery Center Inc. performed a retrospective analysis of client admission and discharge data between 2003-2006 to compare women with primary methamphetamine dependence to other drugs of abuse (alcohol, cocaine and opioids). The admission and discharge records of 6416 patients admitted to a 12-Step residential treatment program were analyzed for baseline and discharge demographics and clinical characteristics. The data revealed significant variation in age, ethnicity, prior treatment history, and concurrent substance use. There were significant differences in ethnicity (97% white), younger age at time of treatment (mean age 22 yrs), and higher rates of child protective service involvement. Methamphetamine users were more likely to identify marijuana as a secondary drug of choice. Results of this analysis of a large cohort of women in residential rehabilitation over a four-year period provide a description of the sociodemographic and clinical characteristics of female methamphetamine addicts in a region that has undergone a sharp rise in methamphetamine use. Further analysis of residential treatment retention, transition to intensive outpatient treatment and readmission (recidivism) will provide further elucidation of the particular challenges facing community providers who treat women addicted to methamphetamine.

**GENDER DIFFERENCES IN MOTIVATION TO ABSTAIN FROM METHAMPHETAMINE USE**

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Motivation to abstain from drug use serves as a better predictor of treatment engagement and treatment outcome than drug use history and demographic profiles. The purpose of the present study was to examine the factors that influence an individual's motivation to abstain. Eighty-eight non-treatment seeking, methamphetamine (MA) using participants (64 male, 24 female) were asked to report their motivation to abstain from MA use at the present time, in one month, and in six months. As a whole, the mean motivation to abstain increased at each of three time points assessed. Females reported a greater motivation to abstain in one month ( $F_{1,83}=7.9$ ,  $p=.006$ ) and in six months ( $F_{1,81}=10.9$ ,  $p=.001$ ), as compared to males. Males having previously attempted to quit using MA reported a greater motivation to abstain at present ( $F_{1,62}=9.8$ ,  $p=.003$ ), in one month ( $F_{1,62}=11.0$ ,  $p=.002$ ), and in six months ( $F_{1,62}=11.2$ ,  $p=.001$ ), than males having never tried to abstain. Females reported a consistent level of motivation to abstain at all time points regardless of previous attempts to quit. Motivation to abstain was not correlated with years of MA use, recent use of MA, withdrawal scores, age, or years of education. These results demonstrate that females possess a greater motivation to abstain from MA in the future than males, particularly males that have never attempted to abstain. Taken together, these data exemplify important behavioral differences between male and female MA users and have practical implications for MA treatment strategies relative to gender. Support provided by NIDA: DA014593, DA017182, DA17705, DA17754.

**NEUROBIOLOGICAL AND BEHAVIORAL PREDICTORS OF SOCIAL RANK IN FEMALE MONKEYS**

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Position in the social dominance hierarchy has been shown to influence sensitivity to drugs of abuse in male monkeys. The present studies examined whether several behavioral and neurochemical measures could predict eventual social rank in female cynomolgus monkeys ( $n=16$ ). Availability of D2 receptors and dopamine and serotonin transporters (DAT, SERT, respectively) was assessed with positron emission tomography. Levels of metabolites of serotonin (i.e., 5-HIAA) and dopamine (i.e., HVA) in cerebrospinal fluid (CSF) were measured and behavioral impulsivity was assessed by measuring latency to touch a novel, opaque box placed in the monkey's home cage. After all baseline measures were obtained, monkeys were assigned randomly to four groups of four monkeys and social behavior was observed three times per week for three months, by which time social ranks in



each pen were considered stable. There was no significant relationship between baseline levels of DAT, SERT or D2 receptor availability and social rank. Regarding impulsivity, a trend was observed such that subjects with shorter latency to touch the object (i.e., more impulsive) were more likely to become subordinate. In addition, significantly higher levels of CSF 5-HIAA were found in the most impulsive animals which became subordinate and a trend for higher CSF HVA ( $p=0.053$ ) was seen in subordinate animals. These data provide evidence for neurobiological and behavioral variables related to monoaminergic function that are trait variables for eventual social rank in female monkeys. Studies are currently underway to determine if these markers are changed by social group formation. Support: DA 017763.

#### **REMISSION FROM ALCOHOL DEPENDENCE AND SEX DIFFERENCES IN A COMMUNITY SAMPLE**

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There is consistent evidence linking major depressive disorder (MDD) and the onset of alcohol dependence; little is known about the role of MDD in remission from alcohol dependence. Further, sex differences exist in the development of alcohol dependence and MDD, but it is not known whether MDD is differentially associated with alcohol remission in men versus women. In an effort to fill this gap, we used data from the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC), a community-based sample that includes self-reported information of the onset of DSM-IV psychiatric disorders. We modeled time to remission and prior history of depression (onset of MDD prior to onset of alcohol dependence) as time-dependent covariates using Cox proportional hazard models. We restricted analysis to those with prior to past year history of alcohol dependence ( $n=4,422$ ). For males, MDD prior to and subsequent to onset of alcohol dependence was associated with a greater likelihood of remission, compared to those without MDD, with  $HR=1.26$  (95% CI: 0.96, 1.64) and  $HR=1.38$  (1.13, 1.67), respectively. No associations were seen among females, when comparing history of MDD prior to and following onset of dependence,  $HR=0.94$  (0.75, 1.18), to those without MDD,  $HR=1.01$  (0.84, 1.22). We found no evidence that treatment seeking mediated the association between MDD and alcohol remission in men,  $HR=1.12$  (0.92, 1.51). In the course of remission from alcohol dependence, MDD appears to have different roles in men and women, and warrants further investigation.

#### **ALTERNATIVE APPROACHES TO CONTROLLING DRUG USE: AN EXAMINATION OF GENDER DIFFERENCES**

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Background: Due to a variety of obstacles such as limited treatment slots and costs, many drug users practice alternative strategies to limit or control their drug use. However, the majority of research on drug use cessation has focused on traditional treatment modalities. There is limited research on other strategies practiced to decrease drug use. The present study examines drug control activities among a sample of active injection drug users (IDUs) in Baltimore, MD. In addition, we examine gender differences. Methods: Participants were recruited from the STEP into Action (STEP) study, a social network based HIV prevention intervention targeting IDUs (2004-2006). Data were collected through face-to-face interviews at a community-based research clinic. The sample consisted of 844 participants who self-reported injection of heroin or cocaine in the past six months. Approximately 64% of the sample was male. Participants were asked whether or not they had engaged in ten different activities as an effort to control their drug use in the past six months. These activities were generated based on ethnographic data. Unadjusted chi-square tests were used to examine gender differences. Results: Female participants were more likely than males to spend time with family or friends, go to church, engage in hobbies, and attend support group meetings ( $p<0.05$ ). Males were more likely to report working/volunteering and exercising/playing sports ( $p<0.05$ ) as activities to control drug use. There were no statistical differences in staying away from certain places or people, avoidance of buying drugs, limiting the amount or frequency of use, or watching TV/movies ( $p>0.05$ ). Conclusions: These findings provide evidence that both men and women have different approaches to controlling their drug use. Women engage in unstructured, social activities while men engage in physical or organized activities. More research is needed to explore how these activities are associated with drug use cessation.

#### **PRELIMINARY FINDINGS ON DYADIC INTERACTIONS FROM THE MOTHERS AND TODDLERS PROGRAM, AN ATTACHMENT-BASED PARENTING INTERVENTION FOR SUBSTANCE-ABUSING MOTHERS**

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Recently collected baseline data from the MTP showed unusually high levels of child responsiveness to maternal cues. One possible explanation for this finding is that children were exerting great efforts to engage the attention of their mothers, most of whom scored below normative means on responsiveness to children's distress. Both low maternal responsiveness and high maternal intrusiveness are frequently observed in substance abusing mothers' interactions with their children. MTP seeks to improve these behaviors by supporting mothers to reflect on their

own emotional needs and intentional behaviors, and those of their children (i.e., maternal reflective functioning; MRF). Using pre and post data from 7 MTP completers, we predicted that 1) high child responsiveness to mothers at baseline would decrease to within the normative range post-MTP, 2) increases in MRF would be associated with decreases in child responsiveness, and 3) this association would be mediated by improvements in maternal caregiving behaviors. Measures were: The Parent Development Interview coded for MRF and the NCAST Teaching Scale coded for mother and child behaviors. In results of paired t-tests and linear regressions, meaningful values were identified by effect size due to the small sample size ( $d$  of .8=large;  $R^2$  of .25=large; Cohen, 1988). Baseline means for child responsiveness to mother ( $M=11.57$ ,  $SD=1.13$ ) and total child score ( $M=21.14$ ,  $SD=1.35$ ) decreased significantly to within normative range post-MTP ( $M=10.00$ ,  $SD=.58$ ,  $t=2.98$ ,  $p=.03$ ;  $M=19.25$ ,  $SD=1.21$ ,  $t=2.70$ ,  $p=.04$ , respectively), and effect sizes were large ( $d=-1.24$ ,  $-1.04$ , respectively). Increased MRF was associated with improved caregiving behaviors ( $R^2=.23$ ) and child responsiveness ( $R^2=.60$ ). Improved caregiving was associated with improved child behavior ( $R^2=.69$ ). Caregiving behavior mediated 70% of relations between MRF and child behavior. Implications for understanding maladaptive mother-child interactions will be discussed in relation to future intervention development.

#### **TOBACCO AND MARIJUANA USE BEFORE TEENAGE PREGNANCY AND 10 YEARS LATER**

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Studies of teenage mothers suggest that, contrary to the pattern typically seen in other young adults, these women do not “mature out” of health-risk behaviors such as tobacco, alcohol and marijuana use (Cornelius et al., 2004; Gillmore et al., 2006). The goal of this study was to longitudinally examine correlates of tobacco and marijuana (MJ) use in African-American and Caucasian girls who were pregnant as teenagers and followed for ten years. Pregnant teenagers (age range = 12-18 yrs.; 68% African-American) were recruited from an outpatient prenatal clinic and interviewed about their pre-pregnancy tobacco and MJ use (Time 1;  $n = 416$ ). The participants were contacted and re-interviewed ten years later (Time 2;  $n = 247$ ; age range = 24-29 yrs.). Outcomes included smoking at Time 2 (tobacco = 42%; MJ = 26%) as well as categorical variables indicating patterns of use over time: quitter (used before pregnancy, but quit by Time 2), post-pregnancy onset (did not use before pregnancy, but used by Time 2), and persistent user (used at both time points). Logistic regression analyses revealed that Caucasians, less educated mothers, and those who had more hostility symptoms at Time 2 were more likely to be tobacco users at Time 2. Peer MJ use at Time 1 and lower SES at Time 2 predicted MJ use. Discriminant function analysis (DFA) on tobacco smokers indicated that peer use during adolescence was the best predictor of group membership, especially persistent tobacco use. DFA on MJ use produced 2 significant functions, one which distinguished quitters from persistent users, and was strongly associated with depression in young adulthood, and a second function that predicted post-pregnancy onset, primarily supported by adolescent peer use. Our findings suggest that these former teenage mothers did not “mature out” of tobacco and MJ use, and that Caucasian teenage mothers are at-risk for persistent tobacco use whereas African-American teenage mothers are at-risk for MJ use. However, psychosocial factors such as adolescent peer use and adult depression and hostility symptoms may be more important predictors of persistent use than race.

#### **GENDER DIFFERENCES IN CESSATION SUPPORT BY PARTNERS OF HEALTH-COMPROMISED SMOKERS**

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Introduction: Independent lines of research suggest that (a) female smokers are less likely to succeed at quitting than men, (b) partner support predicts the success of a smoker's cessation efforts, and (c) relationship quality may be generally more important to the health of women than men. The present study examined partner support in a sample of smokers with health problems. We hypothesized that a smoker's gender would make a difference in the quantity and/or quality of cessation support she or he receives from a spouse or partner, and perhaps also moderate predictive associations between partner support and later cessation outcomes. Methods: Participants were 34 couples in which a primary smoker ( $M$  age=55 yrs.) continued to smoke cigarettes despite having either a diagnosed heart or lung problem or multiple risk factors for heart disease. In 15 couples the spouse also smoked and 20 (of 49) smokers were female. Both partners in each couple completed a modified Partner Interaction Questionnaire assessing spousal attempts to support cessation by each smoker, with scores for positive support, negative support, and perceived effectiveness of the partner's influence attempts. A sub-set of 20 couples subsequently participated in up to 10 consultation sessions designed to promote cessation, with abstinence outcomes assessed at 6 and 12 month follow-ups. Results: Female smokers received significantly less total support (both positive and negative) from partners than males did, irrespective of partner smoking status. In the treatment sample, perceived effectiveness of partner influence attempts at baseline predicted cessation outcomes at follow-up, with associations tending to be stronger for women than men. Conclusions: Women who smoke in the face of health problems appear to receive less cessation support from their partners than men do. Effective partner support may be especially crucial to the cessation success of women. Given known gender differences in relapse risk,

cessation interventions might profitably include partners as well smokers themselves. This study was supported by NIDA R21-DA13121.

#### **A GENDER-SPECIFIC INVESTIGATION OF LONG-TERM DRUG USE AMONG AN URBAN AFRICAN-AMERICAN COHORT**

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This study augments the existing literature on substance use patterns by outlining the natural history of drug use among African Americans. One objective is to provide a close investigation of the intra-group variation among this understudied population. A second objective is to highlight the variation by gender. There has been little research focusing on the female African American drug user from a community cohort using a longitudinal framework. Females may in fact differ in their patterning, antecedents, and consequences of drug use over the life course. A community cohort of African-American inner-city males and females has been followed from childhood through adulthood (first grade, age 16, age 32, and age 42). Nonparametric survival analyses and log-rank tests of significance were used to estimate the initiation of marijuana, cocaine, and heroin use into mid-adulthood. Survival curves were compared for males and females (N=1052). Results indicated that gender is linked to the onset of each drug and to the patterns of drug use throughout the life span. For example, log-rank tests indicate that the survival curves for cocaine incidence were statistically different through age 42 for males and females ( $\chi^2 = 12.27$ ,  $p < .001$ ). In addition, while incidence accumulates for both genders, it is higher for males (35% vs. 25%). Similar results emerged for marijuana ( $\chi^2 = 23.19$ ,  $p < .001$ ; 65% vs. 53%) and heroin use ( $\chi^2 = 7.35$ ,  $p < .01$ ; 10% vs. 6%). Overall, gender plays a role in predicting the onset into substance use throughout adulthood. Preliminary findings, for example, show that, unlike their male counterparts, females who were more mature and attentive in childhood were less likely to use cocaine, even after controlling for early smoking behavior. Further investigation into the gender-specific antecedents and consequences of drug use over the life course and potential mediating and moderating factors are needed.

#### **ISOFLURANE ANESTHESIA DAMPENS COCAINE-INDUCED SENSITIZATION IN THE RAT**

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Repeated cocaine administration results in a progressive sensitization of behavior which typically occurs more readily in female rats than in males. Previous studies of male and female rats undergoing glucose imaging required the placement of catheters for blood sampling and therefore also required anesthesia. In those studies, females repeatedly injected with cocaine showed less behavioral sensitization than males receiving the same treatment. We hypothesized that isoflurane anesthesia reduced or reversed the neurochemical changes associated with sensitization more so in females than in males. In order to test this hypothesis, we administered cocaine at 15mg/kg/day to adult male and female Sprague-Dawley rats and recorded the resulting behaviors for 1 hour on days 1, 9 and 11, the same injection sequence utilized for the functional imaging studies. Both Accuscan locomotor activity and video-taped behaviors were collected. Tapes were analyzed for sniffing, low, medium and high-intensity stereotypy; etc. On day 10, we subjected half of the rats to 45 minutes of isoflurane anesthesia. Results (from 35 subjects to date) show that females are more sensitive than males to the effects of anesthesia and that in females, anesthesia dampened behavioral sensitization following repeated cocaine administration. These data suggest that it may be possible to utilize anesthesia to normalize the neurochemical changes occurring in cocaine addiction primarily in females. Supported by NIDA grant DA10990

#### **ATTITUDES TOWARD RESEARCH AMONG FEMALE OFFENDERS AND GENERALIZABLE METHODS FOR IMPROVING RESEARCH ETHICS AMONG HIGH-RISK POPULATIONS**

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“Sensitive” data collection is the hallmark of substance abuse research. Participants are often vulnerable and stereotyped as having questionable decision-making capacity, being unduly influenced by modest financial incentives, and being fearful of confidentiality violations in research. Sensitive research raises even more ethical concerns when participants are involved in the criminal justice system. While it is universally agreed that vulnerable research participants deserve heightened ethical concern, empirical data is needed to understand participant perceptions and guide protections. The Ethics in Sensitive Research Attitude Assessment (ESRAA), a 31-item instrument for use with participants in sensitive research, was developed to focus on: the informed consent process, privacy concerns, and the use of financial incentives in research. A recently completed study, “Deconstructing HIV Interventions for Female Offenders” (DA19199) incorporated the ESRAA. The study aimed to understand characteristics of HIV prevention interventions salient to female offenders. The research group re-contacted and enrolled 95 of 129 female offenders who had participated in a prior HIV prevention trial (DA11622)

for a re-interview focused on intervention preferences. All 95 women completed ESRAA. Of the women, 52 successfully completed all of the requirements of their randomization in the original HIV study; 43 either dropped out or were non-compliant with the protocol. Two questions guide the analysis of data for this presentation: (1) How are the attitudes assessed by ESRAA related to participants' level of participation and compliance in the original HIV prevention study? (2) What are the participants' views toward many of the standard research protections proposed for vulnerable participants in sensitive research? Results: Chi square tests indicated no significant differences between highly compliant and low complaint participants on any of the salient ESRAA variables. The majority of participants wanted researchers to be active in ensuring comprehension of consent information: they wanted researchers to read the consent form to them (75%), to ensure they were not high during consent (93%), to probe understanding (96%), and to remind them of information at each visit (79%). The majority would not welcome the presence of a third party—a friend (23%), family member (35%), or advocate (36%)—during the consent process. Almost all participants believed that payments for time was only fair (92%) and that payments strongly motivate participation in studies (89%); but did not believe payments alter perceptions of risk (88%). Most believed prisoners (86%) and people who abuse substances (89%) should not be routinely excluded from participation in research studies. Conclusion: Results suggest that ethical concerns did not affect compliance in the previous study and that participants would not welcome some stereotypical protections of vulnerable participants such as consent monitors or reduced payments.

#### **ECSTASY-DEPENDENT USERS ENGAGE IN MORE SEXUAL RISK BEHAVIORS THAN NON-DEPENDENT ECSTASY USERS**

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Do users of MDMA (ecstasy) who meet DSM-IV adopted dependence criteria engage in riskier sexual activities than users who do not meet criteria for dependence of ecstasy? In a NIDA funded tri-city club drug study, current ecstasy users (n=640) were interviewed from three sites: St. Louis, Miami, and Sydney, Australia. The study demographics were: 58% males (n=369), 62% white (n=398), 18% Hispanic (n=113), 9% Black (n=55). The interviews were conducted using an expanded Substance Abuse Module (SAM) and the Risk Behavior Assessment for Club Drugs (RBA). The SAM assessed abuse of and dependence on illicit drugs; the RBA collected risk factor data including high risk sexual behaviors. Ecstasy dependence was determined using a 'cookie cutter' technique with adopted DSM-IV dependence criteria, and was found among 59% (n=377) of the users. Women were more likely to be dependent than men ( $P<.044$ ). There was a higher prevalence of dependence among whites (n=246, 65%), Hispanics (n=72, 19%) and Asians (n=20, 5.3%) versus a lower prevalence for Blacks (n=18, 4.8%). Ecstasy dependent users were 'more likely to have ever been under the influence of ecstasy while having any kind of sex' ( $P<.0001$ ), to be 'less selective about their sex partners' ( $P<.0024$ ), 'less likely to use a condom' when taking ecstasy ( $P<.0096$ ), specifically, when engaging in vaginal sex ( $P<.0044$ ), and was 'more likely to have received club drugs for sex' ( $P<.0068$ ). Dependent users did not report more or less pleasure during sex with ecstasy, and the type of sex act did not differ by dependence. No differences were found between the two groups for any of eleven reasons for not using a condom. This rich database of three sites is unique in that it covers diagnoses and risk factors, and should be useful for understanding risky sexual behaviors histories related to ecstasy use, abuse and dependence.

#### **PROGESTERONE PRETREATMENT ATTENUATES REINSTATEMENT OF COCAINE-SEEKING IN FREELY CYCLING FEMALE RATS**

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Clinical research suggests that gender differences exist in cocaine dependence. Similarly, preclinical studies have shown that female rats exhibit higher response rates during cocaine self-administration, early extinction, and cocaine-primed reinstatement of drug-seeking than male rats. These effects are estrous cycle dependent and may be inversely related to plasma progesterone levels, in that proestrus females (high plasma levels of progesterone) exhibited less cocaine-seeking while estrus females (lowest plasma levels of progesterone) showed the greatest cocaine-seeking. Based on these findings, we hypothesized that progesterone pretreatment would attenuate cocaine-seeking behavior. Thus, the current study examined responding during cocaine self-administration, early extinction, and cocaine-primed reinstatement following progesterone pretreatment in intact, freely cycling animals. Female, Sprague-Dawley rats (n = 32) self-administered i.v. cocaine (0.5 mg/kg/infusion) along a FR1 schedule during daily 2-h sessions. Following self-administration, responding was extinguished in the absence of cocaine reinforcement. Once responding was extinguished to criterion, rats received an injection of cocaine (10 mg/kg, IP) or saline 30 min prior to reinstatement testing. Progesterone (2 mg/kg, SC) or vehicle was administered 4 h prior to reinstatement. Vaginal swabs for cytology and blood samples were collected during chronic cocaine self-

administration, early extinction, and reinstatement testing. A significant increase in lever responding occurred during early extinction and cocaine-primed reinstatement for estrus versus nonestrus females, an effect that was attenuated by progesterone. Taken together, these results suggest that progesterone may be a useful therapeutic for preventing relapse in abstinent female cocaine users. (Supported by NIH Grant DA016511).

#### **A CHILD'S INTENTIONS TO SMOKE TOBACCO AND LATER ONSET OF SMOKING: A LONGITUDINAL STUDY OF MALE-FEMALE DIFFERENCES**

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**AIM:** Here, we estimate a predictive and possibly explanatory role of early behavioral intentions, expressed in childhood, with respect to later onset of tobacco smoking by young adulthood, with attention to male-female differences. **METHODS:** In ongoing longitudinal research, 2311 1st graders (50% male; 33% non-Hispanic White) were assessed periodically during primary and middle school (1985-1994), and then followed-up in young adulthood (2000-2002). In 1989-94, during private confidential interviews, they were asked to indicate on a four-point scale whether they would smoke a tobacco cigarette if it were offered to them by someone they know and trust; we coded responses as "Definitely Not" = 0; Else = 1. During young adult follow ups, roughly 8-10 years after the prior assessments, ~75% were re-assessed via standardized diagnostic interviews, including questions about smoking history. **RESULTS:** Multiple logistic regression slope estimates support a strong predictive and possibly explanatory link from a child's intentions to smoke to later onset of tobacco smoking (estimated relative risk, RR= 1.1;  $p < 0.05$ ). The RR estimate was attenuated but remained statistically robust after covariate adjustment for common antecedents, age, sex, minority group status, and SES (RR=3;  $p < 0.05$ ). Probing male-female differences, we found a substantially stronger prediction or explanation linking earlier intentions with later smoking for females (RR~7;  $p < 0.05$ ); the link was weak for males (RR~1.2;  $p > 0.05$ ). **CONCLUSIONS:** In this study, the assessment of behavioral intentions was not part of a preventative 'commitment pledge' approach, but the study's evidence may help promote an understanding of any observed effect of commitment pledges (not to smoke), with potentially stronger intervention effects for females. **SUPPORT:** NIDA/NIH/FIC awards: D43TW05819; T32DA07292; K05DA015799.

#### **GENDER DIFFERENCES IN A COCAINE VACCINE TRIAL OF TA-CD/08**

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In a double-blind, placebo-controlled randomized clinical trial of methadone maintained, cocaine-dependent patients, 114 subjects (66.7% male) were examined to determine the impact of gender on the outcome of antibody response, treatment response and other broad outcomes to a cocaine vaccine. Subjects were vaccinated with TA-CD/08 over 12 weeks. Serum antibody (Ab) levels were assessed every 4 weeks for 20 weeks and urine toxicology was obtained thrice weekly throughout the duration of the study. Multiple regression analyses and hierarchical linear modeling (HLM) derived estimates were utilized to assess correlation between gender and response. Males comprised 62% of the vaccinated group. Analysis of data from the first 12 weeks during the vaccination period indicates that though gender does not appear to predict antibody response, it does predict overall treatment response. Significant reduction in mean cocaine positive urine toxicology levels from baseline was seen among vaccinated males, vaccinated females and placebo females ( $P < 0.00001$ ,  $P < 0.00001$  and  $P = 0.009$ , respectively). Placebo males did not show any significant change over time. Vaccinated males also showed the strongest overall response to the vaccine, with the greatest reduction in cocaine use, as determined by mean percent cocaine positive urines during the 12 week period. Particularly noteworthy was the significant difference in urine toxicology seen over time compared to placebo males ( $P = 0.0002$ ). Such a difference was not seen between vaccinated and placebo females. Additional analyses of the follow-up, post-vaccination time frame (Weeks 13-20) will be performed to determine if vaccinated males continue to show better overall reductions in cocaine use.

#### **DRUG-USING WOMEN WHO INACCURATELY PERCEIVE SEX RISK ARE MORE LIKELY TO IMPROVE SEX RISK BEHAVIORS AT 4 MONTHS**

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**INTRODUCTION:** While sex risk perception alone has been weakly correlated with protective behaviors, accuracy of risk perception is less well studied as a predictor of behavior improvement. Analyses were conducted to determine if accuracy of sex risk perception predicted improvement in unsafe sexual behavior among drug using women. **METHODS:** Data are from the NIDA funded Women Teaching Women study. Women were recruited through street outreach and received a baseline interview, a standard HIV intervention and STD testing, and were then randomized to receive no further intervention, a well woman exam, or a well woman exam and 4 peer

delivered educational sessions. Sexual risk perception was determined by the following question: "I have risky sexual behaviors that need changing." Women were determined to be accurate or not accurate by comparing their perception to actual behavior in the past 4 months (number of unprotected vaginal, oral, and anal acts, number of male partners, and involvement in sex trading). The effective sample size was 448. RESULTS: No differences in baseline sociodemographic data were found between accurate (n=251) and inaccurate (n=197) respondents. Women who were accurate were more likely to report lifetime cocaine use (95.2% vs. 88.8%,  $p = .011$ ); but, the two groups did not differ in other lifetime drug use, dependence criteria among users, or past 30 day drug use. At 4 months, inaccurate women were two times more likely to improve their sex trading behavior (OR 2 [1.20 - 3.34],  $p = .008$ ). Further analysis will include multivariable logistic regression to determine relationship between accuracy and improvement in number of unprotected sexual acts and number of male partners. CONCLUSIONS: Accuracy of risk perception may play an important role in determining the effectiveness of HIV interventions to increase preventative sexual behavior among high risk women, and should be accounted for in intervention development.

#### **SEX-SPECIFIC CHANGES IN OPIOID AND DOPAMINE RECEPTORS GENE EXPRESSION IN STRIATUM OF CB1 TRANSGENIC MICE**

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The endocannabinoid system has been associated with drug reinforcement. CB1 knock-out mice (CB1 (-/-), displayed reduced ingestion of alcohol and opioids compared to wild-type mice (CB1 (+/+)). (Zimmer et al., 1999; Ledent et al., 1999; Basavarajappa and Hungund, 2005) Rodents pretreated with CB1 antagonist, SR141716 (rimonabant) were less likely to drink alcohol and self-administer opioids (Ledent et al., 1999; Martin et al., 2000). CB1 receptor is highly expressed in striatum (Herkenham et al., 1991); the cannabinoid agonist  $\Delta^9$ -THC caused striatal dopamine release (Hungund et al., 2003). We reported real-time polymerase chain reaction analysis results demonstrating greater gene expression of proenkephalin and prodynorphin (opioid peptides) and dopamine D4 receptors (D4) in striatum from CB1 (-/-) not CB1(+/+). (Gerald et al., 2006, Brain Research) We now report sex-specific differences in gene expression of opioid (delta and mu) and dopamine receptor subtypes (D1 thru D5) in 6+ month old CB1 transgenic mice. Females but not males exhibited greater opioid peptide gene expression in CB1 (-/-) mice compared to CB1 (+/+). There were no sex- or genotype-specific differences in levels of delta, but CB1 (+/+) females expressed greater mu levels than CB1 (+/+) males. There were no sex- or genotype-specific differences in D1. However, expression of D5 was greater in CB1 (+/+) males than in CB1 (+/+) females. There were no sex- or genotype-specific differences in D2. However, expression of D3 was significantly greater in both CB1 (+/+) and CB1 (-/-) males than in females. Previously published data showed D4 expression was greater in female CB1 (-/-) mice compared with female CB1 (+/+); this genotypic difference was not observed in males. These results suggest neuromodulatory differences that are not only dependent on CB1 expression but are also sex-specific. Supported by NIDA grant U24DA12385, NIGMS grant S06-GM08049, NIH grant DA002749, and NCMHD Export grant P20-MD00175.

#### **GENDER DIFFERENCES IN ALCOHOL USE AMONG UNIVERSITY STUDENTS IN LEBANON: THE ROLE OF RELIGION AND RELIGIOSITY**

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Mounting evidence highlights the influence of religiosity on alcohol use in the US, but data on gender differences, especially in the Arab world is scarce. This study examines male-female differences in alcohol use and the role of religiosity in Lebanese university students, further comparing Christians with Western-like drinking patterns to Moslems whose faith prohibits alcohol use. A self-report anonymous instrument was administered to 870 males and 964 females randomly selected using a multi-stage cluster technique from two prominent large universities in Beirut. Alcohol abuse (AA) and alcohol dependence (AD) diagnoses were based on the Diagnostic Interview Schedule-IV. Lifetime abuse and dependence were lower in females of both religious groups, even among lifetime drinkers. This was also true among believers in God (AA: 5.1% vs. 19.1%, AD: 3.2% vs. 9.2% respectively), of both religions. Female believers who practiced their faith had a lower prevalence of AA (4.9% vs. 19.8% in males). Exploring within-gender differences revealed that belief in God lowers odds of AA and AD in males and females of both religious groups, even after alcohol onset. Practice of faith protected both genders against lifetime alcohol use, but only in Moslems. The higher prevalence of AD observed in Christians of both genders disappeared once alcohol use was initiated. In females only, AA was more common among Christians attending a predominantly Moslem university (8.5% vs. 3.1%), and more common among Moslems enrolled in a largely Christian university (5.8% vs. 1.9%). Gender differences in alcohol use exist in Lebanese university students of similar religious faiths and level of religiosity, even after alcohol initiation. Being religious is protective in males and females of both

religious groups. Alcohol abuse is higher in females of one religious faith attending a university largely composed of another faith audience, suggesting that females may be self-selecting themselves into universities.

#### **MOBILE CLINIC FOR WOMEN IN PROSTITUTION AND DRUGS**

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Research on women in prostitution shows most of them define themselves as addicted to psychoactive drugs. While some studies indicate the need to finance drug use is a motivator to enter into prostitution, others found it to be an outcome of the latter, acting as means of coping with pain associated with it. Drug abusing prostitutes are exposed to a variety of hardships. One main area where this is evident is the exposure to infectious diseases (30% to 70% rates of HIV infections among such women in Europe, 80% in the US. Furthermore, most women in drugs and prostitution suffer from PTSD, depression, anxiety, mental distress and low self-worth. Socially, they suffer on two levels of "invisibility", both as prostitutes and as drug addicts. This served as a foundation for the Levinski Clinic mobile clinic. The MC's team consists of a social worker, doctor, mentor (previously in prostitution and drugs) and volunteers. It goes out to streets and brothels, offering medical and psychosocial services to women. Conversations are held at eye level", and initial ties of trust are formed. The team perceives women in drugs and prostitution as entitled to a way out of the cruel cycles they live in. Their understanding of the causes of the downward spiral into prostitution and drugs enable them to relate to the women in a professional and compassionate manner. The MC is unique in its non-judgmental approach, its acceptance to treatment on a "no questions asked" basis and its proactive outreach to women in drugs and prostitution. In 2005-2006, 325 women were tested by the MC in brothels, street corners and a shelter for trafficked women. 90% of the women reported using drugs such as heroine and cocaine and 10% reported using alcohol or tranquilizers. 50% of the women were found to carry type II Herpes. 10% were found to be infected by HIV and other STDs. 50% of the women asked for drug rehabilitation, 15% were referred to rehabilitation centers, and 6% successfully entered rehabilitation."

#### **EFFECT OF GENDER, AGE, AND RACE ON BUPRENORPHINE TREATMENT OUTCOME**

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Objective: To evaluate the influence of gender, age, and race on buprenorphine (BUP) treatment outcome. Method: Secondary analysis of data from a 91-day controlled clinical trial of BUP (2 mg, 8 mg, or 16 mg daily, or 16 mg every other day, sl) for concurrent opioid and cocaine dependence (Montoya et al., 2004). 200 subjects (66.5% male, 75.5% African-American, 59.5% < 35 years of age) were prospectively stratified by gender and age (21-35, 36-50). Time in treatment was evaluated with Cox proportional hazards model regression. Quantitative urine benzoylcegonine (BZE) and morphine concentrations during BUP maintenance (weeks 1-10) were evaluated with repeated-measures linear regression models. Results: There were no significant baseline sociodemographic differences among the four medication groups. Age, gender, and race had no significant effect on treatment retention. Men had significantly lower levels of urine morphine ( $\beta = -0.54$ ,  $SE = 0.10$ ,  $p < 0.0001$ ) and BZE ( $\beta = -0.52$ ,  $SE = 0.12$ ,  $p = 0.0001$ ) compared to women. There was a significant gender by dose interaction for BZE ( $p = 0.003$ ), suggesting that males showed a greater treatment effect at higher BUP doses. African-Americans had significantly higher levels of urine BZE ( $\beta = 0.38$ ,  $SE = 0.13$ ,  $p = 0.002$ ) and morphine ( $\beta = 0.39$ ,  $SE = 0.11$ ,  $p < 0.0001$ ) compared to whites, but there was a significant race by dose interaction only for morphine ( $p < 0.0001$ ). There were no significant gender by race interactions. Age had no significant effect on urine measures. Conclusion: These results suggest that gender and race can affect the outcome of BUP maintenance treatment for concurrent opioid and cocaine dependence, while age (in the range 21-50 years) does not. Supported by Intramural Research Program, NIH, NIDA.

#### **SINGLE-GENDER GROUP TREATMENT FOR SUBSTANCE USE DISORDERS IMPROVES OUTCOMES FOR WOMEN WITH HIGH PSYCHIATRIC SEVERITY**

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The Women's Recovery Group (WRG) is a manualized group treatment for substance use disorders that combines single-gender group composition and women-focused content. A Stage I trial comparing women in WRG ( $n=29$ ) to women in an empirically supported mixed-gender group treatment ( $n=7$ ), Group Drug Counseling (GDC), demonstrated comparable reductions in substance use during treatment for the two groups. Moreover, women in WRG continued to improve in the six months post-treatment while women in GDC worsened. To explore this finding, we examined baseline psychiatric severity using the Brief Symptom Inventory Global Severity

Index(GSI) as a moderator of outcomes assessed during treatment and in the 6 months post-treatment. We fit a repeated measures analysis including a lagged effect for GSI where prior GSI predicts subsequent outcome. Results indicated a significant 3-way interaction effect of treatment condition, time, and GSI for days of any substance use ( $F=7.99$ ,  $p = .005$ ) and number of drinking days per month ( $F=10.09$ ,  $p = .002$ ). The interaction is such that during treatment, women with high psychiatric symptom severity at baseline (i.e. a GSI score of 63 or greater) in WRG were more likely than their GDC counterparts to reduce their drinking days ( $t=1.88$ ,  $p = .06$ ) and days of any substance use ( $t=2.62$ ,  $p=.01$ ). The magnitude and significance of the reductions were even greater in the post-treatment phase; women with high psychiatric severity in the WRG group endorsed significantly fewer drinking days ( $t=2.72$ ,  $p = .007$ ) and days of any substance use post-treatment ( $t=4.61$ ,  $p<.0001$ ) than women enrolled in GDC. These findings suggest that women with greater psychiatric severity at baseline may be better served by a women-focused treatment group than a mixed-gender group condition.

#### **GENDER DIFFERENCES AMONG OPIATE USERS IN A 25-YEAR LONGITUDINAL FOLLOW-UP STUDY**

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**Introduction:** Individuals over aged 50 are projected to comprise an increasingly greater proportion of the substance abuse treatment population in the future. This study examines gender differences in drug use, treatment participation, and psychosocial functioning among opiate-dependent individuals in a 25-year follow-up. **Method:** Subjects ( $N=914$ ) were originally sampled from methadone maintenance clinics in six California counties in 1978-81. An in-depth follow-up assessment is being conducted that obtains longitudinal data on drug use and treatment participation over the follow-up period, and on current psychosocial functioning. **Results:** Out of the original study sample, 391 subjects (42.8%) are deceased; 234 (25.6%) have completed a follow-up interview; an additional 57 (6.3%) have been located, but not yet interviewed; 15 (1.6%) are incarcerated or have declined to be interviewed; and 217 (23.7%) are still being actively tracked for follow-up. The current interview sample consists of 129 (55%) males and 105 (45%) females; 70% are white, 28% are Hispanic, and 2% are African American. Average age at the follow-up interview is 58.9 years for males and 54.9 years for females. **Results:** About two fifths of the sample (36% of males and 41% of females) continued to engage in drug use. About 20% of males and 18% of females reported heroin use in the past year at the follow-up. There was a greater decrease in the proportion of females using cocaine over the follow-up period (29% to 8%), compared with males (24% to 8%), whereas there was a greater decrease in the proportion of males using marijuana (31% to 15%) compared with females (28% to 22%). A greater proportion of females than males reported past-year treatment participation (39% vs. 29%, respectively). **Conclusion:** Data from a long-term follow-up study of individuals with a history of opiate dependence showed that a sizable minority continued engaging in drug use. There was some divergence in patterns of use over time between males and females, as well as in treatment participation. This study is funded by the National Institute on Drug Abuse (DA015390).

#### **METHAMPHETAMINE AND SEX: QUALITATIVE PERSPECTIVES OF WOMEN USERS**

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The relationship between methamphetamine and sex among women is poorly understood. While methamphetamine seems to heighten sexual arousal and activity among gay men, it does not necessarily have these effects among women. Sexual activity may be increased, as some research suggests, but whether arousal and pleasure are enhanced as a result of the drug is not well-researched. This paper focuses on the perspectives of 24 women methamphetamine users receiving residential treatment in the Los Angeles area. Participants completed an in-depth, open-ended interview that explored their life experiences (including trauma, history of drug use, intimate relationships, family) and focused, in part, on the relationship between methamphetamine and sex in their lives. Fourteen Latina, seven White, two mixed-race, and one Native American women participated to date; participants are an average of 28.78 years, with a range of 18-45 years. Almost all (23/24) of the participants are mothers, with an average of 2.68 children. In general, participants started drug use at an early age, in some cases related to early trauma and/or parental drug use. Many were introduced to methamphetamine by family members. Less than half discussed early sexual trauma, but many described maternal neglect (that they then replicated with their own children as a result of their addiction). The methamphetamine-sex connection ranged from no connection to an inextricable connection, with some women at the latter end describing extensive sexual activities including orgies. Some women described feeling sexually empowered by the drug, while others described engaging in more sex and more unusual sex but not necessarily enjoying it. None of the sexually active women engaged in safe sex. Some reported having STDs but none reported being HIV-positive, though some were also IV users in addition to being at risk sexually. Further research needs to be conducted to better understand how women configure the role of methamphetamine in their sexual experiences, intimate relationships, and, ultimately, in their health and well-being.



### **EARLY ONSET CANNABIS PROBLEMS AND YOUNG ADULT MAJOR DEPRESSION: MALE-FEMALE VARIATION**

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**BACKGROUND:** Increased cannabis use among adolescents and reports linking cannabis problems (CP) to other psychiatric disorders has prompted research on adolescent CP and later major depression (MD). Both theory and evidence lead to an expectation of male-female differences in the occurrence of adolescent CP and, independently, MD, with a possibility of male-female variation in the strength of association linking adolescent CP with later MD. Our research tests sex-specific hypotheses that adolescent CP cause later MD. In order to test these potential causal associations two things are required: (1) high-quality longitudinal data collected from childhood through young adulthood and (2) rigorous causal inference statistical methods to control for critical baseline differences such as childhood psychopathology and other substance use. **METHODS:** A cohort of 2,311 first-graders was followed through to young adulthood when approximately 75% completed interviews about personal and social attributes, including substance use and mental health histories. Propensity score estimation and adjustment methods were used to correct regression models estimating the effect of early-onset (before the age of 17) CP on young adult MD. Sensitivity analyses checked the robustness of findings. **RESULTS:** Before male-female stratification, statistically significant but modest CP-MD associations were observed (Odds Ratio (OR) range 1.6-1.8,  $p < 0.05$ ). For males but not females, early-onset CP was associated with increased risk of young adult MD (OR range 1.9-2.2,  $p < 0.05$ ). OR ranges show results were consistent across sensitivity analyses. **DISCUSSION:** After controlling for a large number of childhood confounders, we find evidence of an association between early-onset cannabis problems and young adult major depression. However, if cannabis problems are causing major depression, the link is modest at best and may be limited to males. **ACKNOWLEDGMENTS:** NIDA awards F31DA021956 (PI, Harder); R01DA09897; R01DA04392; K05DA015799 (PI, Anthony).

### **GENDER DIFFERENCES IN STRESS-INDUCED CORTISOL REACTIVITY IN SMOKERS**

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Smoking cessation success rates are generally lower in women than in men. One possible explanation for the gender difference is that some women might respond differentially to stressful situations and thus be more vulnerable to stress-induced smoking relapse. Stress has been implicated as a primary mechanism in relapse to smoking. The objective of the present investigation was to determine if gender differences in cortisol reactivity were present in smokers exposed to a psychological stressor. To date, 15 daily smokers ( $> 10$  cigarettes/day) have completed a laboratory study examining stress as a precipitant of smoking lapse behavior. Prior to a cigarette self-administration session, volunteers were presented with either personalized stress imagery to induce a stress state or personalized relax/neutral imagery to induce a relaxing-neutral state. Personalized imagery was a within-subject variable. Baseline and post-stressor (+5, +20, +35 minutes) cortisol levels were measured. Preliminary results indicate that cortisol reactivity varied as a function of gender and stress across post-stressor timepoints. Males had higher cortisol levels than females at baseline. Cortisol levels rose in males following the stressful imagery. By contrast, cortisol levels in females declined following the stressful imagery. Cortisol levels during the relaxing-neutral condition did not differ across time by gender. The absence of elevated cortisol levels in females in the present study indicates that some female smokers might be unable to mount an appropriate biological response when confronted with a stressor and thus might be more vulnerable to stress-precipitated smoking relapse. The present study indicates that stress management might play a particularly important role in prevention and treatment strategies for women. (Funded by R21DA017234, M01RR000125, P50AA015632).

### **LOBELINE-INDUCED SEX DIFFERENCES IN ADOLESCENT RATS: FEMALES EXHIBIT INCREASED SENSITIVITY TO THE HYPOACTIVE EFFECTS OF LOBELINE**

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Lobeline attenuates methamphetamine (METH) self-administration in adult rats and is currently being investigated as a potential pharmacotherapy for METH abuse. Little is known, however, about the behavioral effects of lobeline in adolescence, a period of increased vulnerability to drug dependence relative to adulthood. The present experiment determined if (1) lobeline alters locomotor behavior of male and female adolescent rats following acute and repeated injection; (2) the lobeline-induced behavioral effects are sex-dependent, and (3) repeated lobeline alters the behavioral response to METH challenge. One hundred and twelve male ( $n = 56$ ) and female ( $n = 56$ ) adolescent Sprague-Dawley rats were injected with saline on post-natal day (PND) 28 to determine baseline locomotor activity. Animals received saline or lobeline (1.0 - 10.0 mg/kg) injection daily on PND 29 - 35, and were injected with saline on PND 36 to determine a second baseline. All rats received a METH challenge (0.56 mg/kg) on PND 37 to determine if previous lobeline treatment altered the behavioral response to METH. Lobeline produced hypoactivity following acute and repeated injection. Females exhibited increased lobeline-induced

hypoactivity following acute and repeated injection, relative to males. Baseline 2 data indicate that animals previously treated with lobeline (10.0 mg/kg) exhibited hyperactivity following the saline injection. Repeated lobeline treatment did not alter the effects of METH challenge; however, females exhibited increased locomotor activity following METH injection, compared to males. Lobeline is behaviorally active in adolescent male and female rats following acute and repeated injection within a dose range shown to decrease METH self-administration in adult male rats. The increased sensitivity to lobeline and METH by adolescent females suggests that both sexes should be investigated when testing potential pharmacotherapies for drug dependence.

#### **SEX DIFFERENCES IN THE LOCOMOTION-DEPRESSING EFFECTS OF TETRAHYDROCANNABINOL DURING ADOLESCENCE**

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The use of marijuana has been shown to cause motor depression in rodents. Additionally, the ontogeny of cannabinoid receptors from early postnatal ages through adulthood shows some sexual differences in the locations and density of receptors (Rodriguez de Fonseca, et al., 1993). In the present study, we investigated the differences in effects of Tetrahydrocannabinol (THC), the major psychoactive component of marijuana, on locomotor activity in male and female rodents. We hypothesized that locomotor depression and tolerance would develop differentially dependent upon the sex and age of the animals. Male and female Sprague Dawley rats (n=56, to date) were dosed via intra-peritoneal injection with either THC at 2 mg/kg or vehicle daily during post-natal days 22-40 or days 41-60. Locomotor activity was assessed on the first, seventh, and final day of dosing. Total distance traveled was recorded over 5 minute intervals during the first 60 minutes after drug administration. Analysis of locomotor activity data (in 15 minute blocks of time) showed significant between subject interactions of sex and drug treatment, as well as significant within subject interactions dependent upon the day of testing, treatment and sex. In general, older males were most responsive to the locomotion-depressing effects of THC. Locomotor activity in younger male and female rats appeared to be similarly affected by THC, with the exception of males at the youngest age studied, where THC stimulated locomotor activity. While tolerance did not develop in younger animals through post-natal day 40, data suggest that tolerance develops by post-natal day 60. Studies were supported by NIH grant RO1 DA019348.

#### **AFTERCARE ATTENDANCE PARTIALLY MODERATED BY HISTORY OF PHYSICAL ABUSE AND GENDER**

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This secondary analysis examines the relationship of participant gender on aftercare attendance, and the moderating effects of a history of physical abuse. Four residential addiction treatment centers participated in a NIDA-sponsored Clinical Trials Network feasibility study designed to estimate the efficacy of a post-discharge telephone intervention intended to encourage compliance with aftercare. Participants were 282 outpatients (100 women, 182 men) with substance use disorders. The findings revealed that the odds of attending aftercare were 1.91 times higher in women than men (95% CI: [1.2, 3.2];  $p < 0.01$ ). Women were also more likely to report higher rates of physical abuse (PA; 78% women vs. 45% men,  $p < 0.01$ ) and sexual abuse (SA; 67% women vs. 20% men,  $p < 0.01$ ). To determine whether prior PA or SA confounded the gender effect observed, separate logistic regression models were used to test each interaction. A significant gender by PA interaction was found ( $p < 0.01$ ), but no interaction between SA and gender ( $p = 0.68$ ). While the interaction between SA and gender was not significant, the gender effect persisted after adjustment for history of SA. For the PA by gender interaction, women without PA were more likely to return for aftercare when compared to men with PA (OR=11.9,  $p < 0.01$ ) or men without PA (OR=12.4,  $p < 0.01$ ); however, the odds of aftercare for women with PA were one-tenth times that of females without PA (OR=0.1,  $p < 0.01$ ). Women with PA were no more likely to attend aftercare than either males with (0.34) or without PA ( $p = 0.25$ ). The findings suggest that women may be more influenced by the post-discharge telephone intervention than men, although it is not clear from the data whether this is a result of the women benefiting more from this particular intervention or the result of other unmeasured variables. Further studies are needed to better understand the observed gender effect.

#### **COMPARISON OF CHARACTERISTICS OF OPIOID-DEPENDENT PREGNANT WOMEN IN RURAL AND URBAN SETTINGS**

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Historically, concern over opioid and other drug abuse has focused on urban America. More recently, rural areas have seen significant increases in the availability of heroin and in the illegal use of prescription pain medications and there are important questions as to whether rural populations differ from the more familiar profile of urban opioid abusers. While relatively little is known about rural drug abuse, even less is known about rural drug abuse

during pregnancy. Our ongoing multi-site trial, the MOTHER study, presents a unique opportunity to compare demographic and other variables in opioid-dependent pregnant women seeking treatment at rural vs. urban sites. Thirty women screened for possible study participation in Burlington, VT (population 39,148) were compared to 173 women screened in Baltimore, MD (population 635,815). Rural women were younger (24.4 vs. 30.6,  $p < .001$ ) and higher percentages were Caucasian (97% vs. 52%,  $p < .001$ ) and employed (28% vs. 3%,  $p < .001$ ). Regarding the pregnancy, a higher percentage of rural participants reported that they intended to become pregnant at this time (17% vs. 9%,  $p < .05$ ). In terms of current drug use, lower percentages of rural women reported daily opioid use (86% vs. 97%,  $p < .01$ ) and cocaine use in the past 30 days (3.6% vs. 70.5%,  $p < .001$ ). Rural women also reported living farther away from the treatment clinic (23.4 vs. 10.9 miles,  $p < .01$ ). Regarding prior treatment history, a lower percentage of rural women reported receiving prior drug treatment (76% vs. 98%,  $p < .001$ ). Relatedly, a lower percentage of rural women reported prior methadone treatment (47% vs. 95%,  $p < .001$ ) and that the first episode occurred at an older age (27.8 vs. 23.9,  $p < .05$ ). Overall, results suggest that rural opioid-dependent pregnant women may have some characteristics that would suggest better treatment response. However, they may face additional barriers in accessing that treatment.

#### **THE TREATMENT NEEDS OF FEMALES WITH A SUBSTANCE USE DISORDER IN THE PUERTO RICAN PRISON SYSTEM: IMPLICATIONS FOR TREATMENT PLANNING**

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**Background:** Although 1.9% of the Puerto Rico population has a lifetime diagnosis of drug dependence, 40% of women in prison are drug dependent while 22% have abused illicit drugs. Prisons provide an opportunity to treat and refer upon release participants to community based treatment to enhance social re-integration. Patient centered drug treatment must address the specific social and psychological needs of women with a drug use disorder. To inform treatment planning, we explore the social and psychological needs of women inmates who fulfill criteria for a lifetime substance use disorder. **Methods:** Cross sectional study in 2005 with a representative sample of the sentenced inmate population of the Puerto Rican correctional institutions. Data gathered anonymously from 1,179 respondents (220 women and 959 men) using two structured interviews: CAPI (Computer Assisted Personal Interview) assessing social and health variables and diagnosis of drug/abuse dependence and ACASI (Audio Computer Assisted Self Interview) for sensitive information related to the use of illicit drugs and risky behaviors. **Results:** 63% of females had a lifetime diagnosis of drug abuse/dependence. Diagnosis was significantly associated with unstable housing ( $X^2=5.25$ ,  $p=0.02$ ); relatives with significant drug problems ( $X^2=9.16$ ,  $p=0.002$ ); number of dependents before entering prison ( $X^2=14.79$ ,  $p=0.00$ ); previous incarcerations ( $X^2=20.76$ ,  $p=0.00$ ); attempted suicide ( $X^2=5.31$ ,  $p=0.02$ ); blood-borne viruses ( $X^2=23.74$ ,  $p=0.00$ ); concurrent psychiatric conditions ( $X^2=510.22$ ,  $p=0.02$ ) and victimization in the last year ( $X^2=11.87$ ,  $p=0.00$ ). **Conclusion:** Treatment for drug abuse/dependence for incarcerated women needs to address social as well as physical and mental health factors that can constitute barriers to their successful rehabilitation.

#### **GENDER DIFFERENCES IN HPA RESPONSES TO STRESS AND DRUG CUES IN COCAINE PATIENTS COMPARED WITH SOCIAL DRINKING CONTROLS**

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Corticoadrenal responses associated with stress and drug cue are affected by gender and, along with stress-related craving, are predictive of relapse in cocaine abusers. Research examining mechanisms underlying stress-related sensitization in cocaine dependence have also been limited by the exclusion of well-matched controls. Differences in gender-related sensitization to HPA markers were assessed in 40 recently abstinent treatment-seeking cocaine abusers (23M/17F) and 40 social-drinking controls (21M/19F). All were matched for race, educational status and age. Participants were exposed to 3 imagery conditions: stress, drug-cue and neutral/relaxing imagery and sessions were presented randomly on consecutive days, one imagery per day. Stress system markers (ACTH, cortisol, prolactin) were assessed at baseline and various recovery time-points following imagery. Males demonstrated higher basal cortisol compared with females ( $p=.03$ ) and male cocaine patients demonstrated higher basal ACTH compared with both female cocaine patients ( $p<.0001$ ) and male controls ( $p=.0006$ ). Significantly higher basal prolactin was observed in females compared with males ( $p<.009$ ), and in the controls compared with cocaine patients ( $p=.05$ ). Following imagery, males showed significantly higher levels of stress-induced cortisol compared with females ( $p=.0002$ ) and demonstrated significantly increased ACTH in the stress compared with the neutral imagery condition ( $p=.0009$ ). This effect of stress on ACTH was not observed in the females. Females showed a significant cue-related increase in cortisol ( $p<.0001$ ) and decrease in prolactin ( $p=.0008$ ). Such gender-related dissociations in stress and cue-related HPA drive may contribute to increased relapse risk and could provide a viable avenue for pharmacological treatment development in cocaine dependence (P50-DA16556 (Sinha), K02-

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**PERSONS ENTERING RESIDENTIAL SUBSTANCE ABUSE TREATMENT IN LOS ANGELES: HOW GENDER, DEPRESSION AND ALCOHOL DISORDERS ARE RELATED TO SUBSTANCE ABUSE RETENTION**

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Using data collected from the largest publicly funded substance abuse treatment provider in Los Angeles County, we examined rates of a probable alcohol use disorder, depressive symptoms, and treatment retention among those entering residential substance abuse care. Data from 321 clients entering treatment between December 2005 and July 2006 were examined. Clients who were still in AOD treatment were screened for depression using the PHQ-9, 14-30 days after treatment entry. We expected that the presence of multiple disorders would negatively impact retention rates and that depressive symptoms would be more prevalent among clients with an alcohol use disorder. 37% of clients entering treatment were women and the racial/ethnic background of the sample was 24% African American, 38% Caucasian, 34% Hispanic, 1% Asian, and 3% other. We found that rates of a probable alcohol disorder at treatment entry were 51% among men (AUDIT-C > 4) and 41% among women (AUDIT-C > 3). 78% of the sample was screened for depressive symptoms; 16% had dropped out of treatment before the depression screening could be completed and 6% had missing data. Rates of depressive symptoms were higher among women than men (39% of women expressed moderate to severe symptomology as compared to 24% of men). In this sample, a probable alcohol use disorder was not found to be related to depressive symptoms. Additionally, treatment retention was not found to be influenced by depressive symptoms. A probable alcohol use disorder was related to lower retention rates in women but not men. These data indicate that women suffering from a probable alcohol use disorder may be less likely to stay in treatment regardless of depression status.

**GENDER DIFFERENCES IN THE COMORBIDITY OF SMOKING BEHAVIOR AND MAJOR DEPRESSION**

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Background. It is established that nicotine dependence is associated with depression. Yet, less is known about the relationship between non-dependent smoking and depression. Currently, 12% of the population meets criteria for nicotine dependence, whereas 23% are daily or occasional smokers, and 19% are prior smokers. The present investigation sought to determine whether smoking behavior was associated with current or lifetime major depression. Because negative affect has been more consistently associated with smoking in women than in men, and has been identified as a risk factor for poor quitting outcomes, we examined whether this association was greater in women. Methods. Data were derived from the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC; Wave 1, 2001-2002, n = 42,565). Relationships between smoking status (daily, occasional, prior) and DSM-IV major depression (current or lifetime) by gender were assessed in terms of odds ratios using logistic regressions, adjusting for race, education, marital status, and age. Results. Current (daily, occasional) and prior smoking significantly increased odds of having current or prior major depression. These associations varied as a function of gender. Women with prior smoking were at significantly higher risk of current and past depression than men (OR: 1.53 vs 1.36; 1.72 vs 1.36), as was true for current occasional (OR: 1.92 vs 1.39; 1.90 vs 1.30) and daily smoking (OR: 2.52 vs 1.95; 1.84 vs 1.48). Conclusions. The association between smoking and current or past depression is not necessarily limited to smoking that meets criteria for nicotine dependence, and is more potent in women. Daily and occasional smoking may be used preferentially by women in response to depressive symptoms. Smoking-cessation interventions for this population must also consider the role of depression. Supported by R03AA016267 and P50AA015632.

**GROUP IPT FOR WOMEN PRISONERS WITH COMORBID SUBSTANCE USE AND DEPRESSION**

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Research on treatments for incarcerated women with co-occurring substance use disorder (SUD) and depressive disorder (DD) is sorely needed. Female offenders have high incidences of both SUD and DD, and DDs decrease the likelihood of recovery from SUDs and increase the risk of suicide and in an already vulnerable population. IPT addresses the interpersonal difficulties and inadequate social supports that appear to underlie many comorbid DDs and SUDs in women prisoners. This study provides a preliminary test of the efficacy of group IPT for DD, depressive symptoms, and social support among female offenders with SUDs. Participants (N = 25) in this open trial met the following inclusion criteria: (1) current enrollment in prison SUD treatment, (2) SUD one month prior to incarceration, and (3) current major depressive and/or dysthymic disorder. Women with bipolar or psychotic disorders were excluded. Women attended 24 group sessions over 8 weeks. Intent-to-treat analyses showed that 72% of the women no longer met SCID criteria for any depressive disorder post-treatment. Two-tailed paired t-tests showed significant improvement on the following measures from pre-treatment to post-treatment [M(SD)]:

Hamilton Rating Scale for Depression [26.2(6.8) to 13.3(9.0)] ( $p < .001$ ), Beck Depression Inventory [25.8(8.3) to 14.7(11.5)] ( $p < .001$ ), and the Multidimensional Scale of Perceived Social Support [50.9(20.0) to 58.8(20.6)] ( $p < .01$ ). Findings demonstrate the feasibility of conducting group IPT with women prisoners in SUD treatment, a vulnerable and understudied population. Observed improvements in DD and social support are encouraging, especially given the high prevalence of antisocial and borderline personality disorders and histories of physical or sexual abuse in our sample. Further research is needed to compare group IPT to a treatment control and to demonstrate that improvements in DD and interpersonal functioning in prison translate into reduced risk of SUD relapse after release. A randomized clinical trial with post-release SUD assessment and 3-month follow-up is currently underway.

#### **ON THE ROCKS: BARRIERS TO TREATMENT-SEEKING AMONG AFRICAN-AMERICAN WOMEN WHO ARE CHRONIC CRACK USERS**

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A women-focused HIV prevention intervention developed in North Carolina in 1998 and found to be evidenced-based that addresses cultural, contextual, and gender issues was successfully implemented to reduce HIV risk among out-of-treatment and underserved population of African-American crack-using women. The continuation of this study provides unique longitudinal data on 444 long-term crack-using women who re-enrolled since 2004. A combination of quantitative ( $N=444$ ) and qualitative ( $N=20$ ) data were analyzed to examine the hypothesis that crack-using African American women perceive numerous barriers to substance abuse treatment. Although crack use dropped from the original baseline assessment to this continuation study, 80% admitted to crack use in the past month. More than 69% of the sample reported needing substance abuse treatment, but less than 25% of the women reported that they were confident that they could access these services, and even fewer had received any kind drug treatment (15%) since the last follow-up assessment. However, 17% of the sample ( $n=74$ ) tried but were unable to get into drug treatment or a detox program in the past year. Perceived barriers to substance abuse treatment programs included not qualifying (38%), not having enough money (46%), no open slots (49%), not having childcare (8%), not having transportation (23%), fear of child protective services (13%), spouse/partner resistance (22%), and imprisonment (16%). In-depth interviews with a sample of 20 of the women further explored barriers to treatment, including when they tried and possible missed opportunities for treatment services that were available but not received. Common themes that emerged included concerns about maintaining employment, lack of childcare and protective services taking away their children. These results underscore not only the necessity of linking at-risk women in community-based interventions to women-sensitive treatment services, but also challenging systems to be responsive when women seek services.

#### **DRUG USE IN PREGNANT WOMEN WITH MOOD DISORDERS**

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Prenatal drug exposure is associated with adverse effects on offspring and many psychiatric disorders are comorbid with drug use. We compared drug use in 276 women recruited at 20 weeks gestation with primary mood and/or anxiety disorders (68.1%) and controls (31.9%). Participants were drawn from the Greater Pittsburgh area from 2003-2006. Outcome measures were current drug use and quitting drug use. Major psychiatric disorder categories were classified using DSM-IV-TR criteria. Control status was defined as having no diagnosis. Other measures were age, race, education, parity, marital status, past antidepressant use, past alcohol and drug use (cannabis, cocaine) with age of onset, current alcohol use, and past physical/sexual abuse. Univariate analyses and multivariate logistic regression modeling assessed statistical differences between groups. Mean age ( $29\pm 6$  years, both), Caucasian race (cases 69%, controls 73%), mean parity (2, both), and education (cases 61.9%, controls 68.1% college+) were similar between groups. Cases were 17.5% less likely to be married than controls ( $p < 0.01$ ). Past occurrence of antidepressant use (cases 61.7%, controls 5.7%;  $p < 0.01$ ), alcohol use (cases 48.9%, controls 22.7%;  $p < 0.01$ ), drug use (cases 44.7%, controls 21.6%;  $p < 0.05$ ), and physical/sexual abuse (cases 41.6%, controls 15.1%;  $p < 0.01$ ) were more prevalent in cases than controls. Cases had an older age of drug onset than controls (years  $19\pm 4$ ,  $16\pm 2$ ;  $p < 0.05$ ). Current drug use in early pregnancy was also greater in cases (17%) than controls (6.8%) ( $p = 0.02$ ), however, quitting occurred at similar rates (cases 64.3%, controls 73.7%;  $p = 0.44$ ). Significant predictors of current drug use were case status (odds ratio (OR)=3.0), younger age (OR=0.9), increased parity (OR=1.3), less past alcohol (OR=0.3), and more past drug use (OR=8.0). The only significant predictor of quitting drug use was older age (OR=1.1). Women in early pregnancy with primary mood and/or anxiety were three times more likely to use drugs, and were not more likely to quit, highlighting the need for lifestyle intervention in women with comorbid psychiatric and drug use disorders.

### **GENDER DIFFERENCES AMONG IN- AND OUT-OF-TREATMENT OPIOID-DEPENDENT INDIVIDUALS**

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There is a growing interest in discovering gender-sensitive and -specific factors related to drug treatment. Gender differences were explored as part of a study of treatment entry and engagement among adults who met the criteria for methadone maintenance. Participants included 169 opioid-dependent individuals enrolling in six methadone programs and 74 out-of-treatment opioid-dependent adults recruited from the community using targeted sampling. ASI baseline composite scores and selected ASI items were compared for three groups: 1) in-treatment: women v. men; 2) out-of-treatment: women v. men; and, 3) women: in-treatment v. out-of-treatment. Oneway ANOVAs on ASI composite scores indicated that in-treatment women showed significantly greater problem severity on the medical, employment, drug use, family, and psychiatric domains (all  $p < .05$ ) than did in-treatment men. Out-of-treatment women showed significantly greater problem severity than did out-of-treatment men on the employment domain ( $p = .044$ ) only. Those women who were in treatment showed significantly less problem severity on alcohol ( $p = .038$ ) and legal ( $p = .001$ ) domains but significantly greater problem severity on the family ( $p = .05$ ) domain than did those women who were out of treatment. In-treatment ( $p = .045$ ) and out-of-treatment women ( $p = .049$ ), compared to their male counterparts, and out-of-treatment women ( $p < .001$ ), compared to in-treatment women, used cocaine, but not heroin, on significantly more days during the 30 days prior to baseline. Finally, both in-treatment ( $p = .040$ ) and out-of-treatment ( $p = .042$ ) women had significantly more treatment episodes than did their male counterparts, and in-treatment women ( $p < .001$ ) had significantly more treatment episodes than did out-of-treatment women. These findings indicate the greater severity of psychiatric, cocaine, family and employment problems of female than male opioid addicts enrolling in treatment and underline the need for gender-sensitive and perhaps for gender-specific drug treatment services.

### **INCUBATION OF COCAINE-SEEKING BEHAVIOR IS ENHANCED AND MORE ENDURING IN FEMALE RELATIVE TO MALE RATS**

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Females display higher initial sensitivity to the effects of cocaine, undergo a higher degree of neuroadaptations following experience with cocaine, and exhibit higher motivation to self-administer cocaine. The role of time-dependent elevation or "incubation" of cocaine-seeking behavior during cocaine withdrawal has previously been investigated in male but not female rats. Accordingly, the present study assesses sex differences in time-dependent enhancement of cocaine-seeking behavior. Male and female Sprague-Dawley rats were implanted with jugular catheters and trained to lever press to self-administer cocaine (0.50 mg/kg/infusion on a FR1 schedule). Infusions were paired with a light + tone CS for 5 s and followed by a 20 s time-out in which no further reinforcement could be received. Following SA training, rats received forced abstinence for either 1 d or 180 d prior to testing cocaine-seeking behavior. Each rat was tested for extinction responding for 5h in which lever pressing had no consequences, conditioned-cued reinstatement for 1 h in which lever presses resulted in presentation of the light+tone CS, and then for vehicle and cocaine (10 mg/kg, i.p.) primed reinstatement each for 1 h. Both males and females displayed time-dependent increases in extinction and conditioned-cued reinstatement conditions responding but only females exhibited increases in cocaine-primed responding. Moreover, extinction responding in females did not differ at the 60 and 180 d time-point, whereas males exhibited higher extinction responding at 60 d than at 180 d. Thus, it appears that incubation of cocaine-seeking is more generalized across testing conditions and more enduring in females relative to males. These findings indicate that sex differences occur in the time-dependent incubation of cocaine-seeking behavior. Thus, gender variables appear to contribute to an individual's propensity to relapse to drug seeking following periods of prolonged abstinence. Supported by NIDA grant R03-DA021161.

### **PARENTING STRESS, SENSE OF COMPETENCE AND SELF-EFFICACY IN MOTHERS RECEIVING OUTPATIENT DRUG TREATMENT**

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The primary objective of this study is to provide a more comprehensive assessment of the multifaceted construct of parenting by mothers in a gender-specific outpatient drug treatment program. A secondary objective is to describe whether the different dimensions of parenting change over time in a sample of women who were mostly drug-abstinent. Of 36 potential participants, 25 were eligible and 14 mothers of at least one child under the age of 15 years (56%) consented to participate in the study. Assessments were conducted at intake (within 2 weeks of admission), at 2 months and then again at 6 months. Measures were Parenting Stress Index-Short Form, Parenting Sense of Competence Scale, Parenting Scale, and Dyadic Parent-Child Interaction Coding System II. At intake,

mothers in this sample reported being more lax, showing more over-reactivity to their children, and feeling less parenting self-esteem and self-efficacy compared to normative samples. On all other parenting measures, sample mothers were similar to normative samples in reporting relatively little parental distress, high satisfaction with the parent-child relationship and that their children were easy; and similar levels of parenting satisfaction as the normative sample. Only 2 of 14 mothers agreed to allow the researchers to videotape them playing with their children (14%); therefore, direct observation of actual parenting behavior was difficult to assess. Due to the small sample size, repeated measures ANOVAs were not statistically significant; however, visual analysis revealed several patterns. Mothers experienced a decrease in parenting self-esteem between intake and 2-months, but returned to intake levels by 6-months. Their parenting stress was the same between intake and 2-months but decreased by 6-months. Throughout the study, participants reported making disciplinary mistakes. Despite many limitations, these preliminary data provide a more comprehensive conceptualization of parenting by mothers in drug treatment. The results of this study have implications for the focus of parent training interventions.

#### **FREQUENCY AND TYPE OF ADVERSE EVENTS ASSOCIATED WITH TREATING WOMEN WITH TRAUMA IN COMMUNITY SUBSTANCE ABUSE TREATMENT PROGRAMS**

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Background: A substantial number of women who enter substance abuse treatment have a history of trauma and meet criteria for Post Traumatic Stress Disorder (PTSD). Fear regarding the extent to which PTSD treatment can evoke negative consequences remains a research question. The NIDA Clinical Trials Network (CTN) recently completed a national multi-site randomized controlled study with 353 women who met criteria for either full or threshold PTSD and a substance use disorder (SUD). Design: Eligible women who were enrolled in substance abuse treatment received either 12 sessions of Seeking Safety (SS), a PTSD specific intervention, or 12 sessions of a women's health education intervention (WHE). All women were enrolled in treatment as usual at the community substance abuse programs. Both substance abuse and PTSD outcomes were assessed post intervention at 7 weeks and at 3, 6, and 12 months. Participants were monitored on a weekly basis throughout the study intervention for the occurrence of any adverse events (AEs). Analyses: Descriptive statistics were used to explore the frequency and type of AEs. Independent sample t test for continuous variables and Chi-square for categorical variables were used to examine study safety across treatment groups. Results: Fifty (16%) of the women reported study related AEs throughout the study intervention and 7 week post intervention follow-up. There were no significant between group differences in the number of women who reported AEs (9% for SS, 7% for WHE;  $p = 0.17$ ). The average number of study related AEs was 1.5 (0.9) for the SS group and 2.0 (1.2) for the WHE group ( $p = 0.2$ ). The most common study related AEs were worsening of depressive and PTSD symptoms, but differences were not significant between groups. Conclusion: Implementing PTSD treatment in substance abuse treatment programs appears to be safe, with minimal impact on intervention-related adverse psychiatric and substance symptoms.

#### **RELATION BETWEEN NEUROBEHAVIOR DISINHIBITION AND SUBSTANCE USE DURING ADOLESCENCE IN MALES AND FEMALES**

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Objective: Numerous investigations revealed that behavioral, affective and cognitive processes are associated and they are risk factors for substance use disorder (SUD). This study (1) examines neurobehavior disinhibition (ND), which is a unidimensional latent trait of behavioral, affective, and cognitive capacity, is a risk factor for substance use and (2) identifies similarities and differences of ND in males and females in predicting substance use. Method: Children with fathers having lifetime SUD (high risk:  $n=154$ ) and no SUD (low risk:  $n=209$ ) were prospectively tracked from ages 10-12 to 16 years. Results: A repeated measures design revealed that there was a significant interaction effect of gender and time of assessment (10-12 vs. 16;  $p<.01$ ). In high and low risk groups, males had significantly higher ND scores than females at age 10-12, but there was no gender difference at age 16. Group (high risk scored higher than low risk) ( $p<.01$ ), gender (males scored higher than females;  $p<.01$ ) and time of assessment (subjects at age 10-12 years scored lower than subjects at age 16 years;  $p=.02$ ) were also significant. In both males and females, ND at age 16 predicted number of drugs tried and current drug use at age 16. However, ND at age 10-12 years predicted current drug use and number of drugs tried at age 16 in males but not in females. Conclusion: These results indicated that ND was an important risk factor for substance use in males and females.

### **COCAINE DISCRIMINATION IN MATERNALLY SEPARATED AND HANDLED PUPS AS ADULTS**

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Repeated maternal separation of pups from dams during critical periods of development has been reported to produce profound and long-lasting neurochemical and biobehavioral changes to the pups as adults. A recent report by Moffett et al. (2006) showed that maternally separated (MS) rats acquired cocaine self-administration (SA) at a lower dose than the other rearing conditions, while handled animals (MH) showed a relatively flat dose-response function. It may be the case that MS and MH rats are differentially sensitive to the interoceptive cue of cocaine which accounts for the differences seen in SA. In a test of this differential sensitivity, the present study assessed the effects of rearing condition in an operant drug discrimination preparation in male and female Sprague-Dawley rats (n=36). MS, MH and animal facility reared (AFR) rats were trained to discriminate cocaine (10 mg/kg, ip) from saline (1 ml/kg) on an FR10 schedule of reinforcement. Acquisition of the discrimination was reached in <50 sessions with no differences between rearing condition or sex. Repeated measures ANOVA revealed that tests with novel doses of cocaine produced no differences in generalization between rearing condition in males or females. All groups showed full generalization at 5.6, 10 and 18 mg/kg, partial generalization at 3.2 mg/kg and no generalization at 0.56 and 1.0 mg/kg with the exception that female MH animals showed only partial generalization at 5.6 mg/kg. Further, no rearing differences were found in the amount of days to meet criterion for additional testing after tests with novel doses of cocaine. Females displayed a dose-dependent decrease in rate of responding, an effect not seen in males. Under these parameters, separated and handled rats do not appear to be differentially sensitive to the discriminative stimulus effects of cocaine. Supported in part by a grant from the Mellon Foundation to ALR

### **COUPLES-VS. INDIVIDUAL-BASED THERAPY FOR MATERNAL DRUG USERS: EFFECTS ON CHILDREN'S ADJUSTMENT**

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Purpose. Studies have shown that couples-based drug treatment for parents with custodial children in the home have beneficial, secondary effects for children when fathers are the identified drug-abusing parent (Kelley & Fals-Stewart, 2002). However, evidence suggests that among children of drug users, mothers may be more influential than fathers (Stanger et al., 2004). This investigation compared the effects of couples-based versus individual-based therapy for female patients and their spouse/partners entering drug treatment on the psychosocial functioning of children living in their homes. Methods. Married or cohabiting female patients who were entering drug treatment and had a custodial child (6 to 16 years) were randomly assigned to either: (a) Behavioral Couples Therapy (BCT); (b) Individual-Based Treatment (IBT); or (c) couples-based Psychoeducational Attention Control Treatment (PACT). Parents completed the Pediatric Symptom Checklist (PSC), a brief screening inventory that assesses children's emotional and behavioral functioning, at pretreatment, posttreatment, 6-mos posttreatment, and 12-mos posttreatment. Results. Relative to baseline, PSC ratings of children's emotional and behavioral functioning significantly improved at posttreatment, 6- and 12-month follow up across all conditions. However, throughout the follow-up period, children whose mothers participated in BCT showed greater improvements than children of mothers in both IBT and PACT conditions. Conclusions. Although any form of treatment for maternal drug users may be helpful, couples-based interventions that address parents' relationship and communication skills may have greater, sustainable benefits on their children relative to other individual or psychoeducational-based treatments. Addressing relationship skills between parents may affect children both directly through reduced parental conflict and indirectly through secondary improvements in parenting and family contexts.

### **WOMEN ONLY - THERAPEUTIC COMMUNITY FOR ADDICT WOMEN**

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During recent years awareness in Israel is growing that within the treatment and rehabilitation system a different and specific solution must be found for addicted women. Field data show that the percentage of women seeking treatment, is lower than that of men. Fewer women continue treatment or succeed in finishing it. In view of these data we decided to establish a unique treatment facility for women only. Addicted women have different characteristics and needs than men. Approximately 90% of addicted women have experienced sexual trauma, many suffer from psychiatric comorbidity. Addicted women in Israel carry a more severe social stigma than men. Despite the above mentioned factors, all treatment facilities in Israel have been established with a male attitude", having an inflexible structure that reminds army life and that does not contribute to their ability to adapt themselves to the existing system. As a small minority in the existing system, it is difficult for them to survive, even if their rights seem to be protected. We reasoned that women need an intimate, non-threatening treatment environment, warm and family-like. The "women only" house can absorb up to 12 women (lately expanded to 18 women) above 18 years old for a year, under boarding conditions, with the possibility to stay an additional six



months in a follow-up facility. The scheme brings all the special components needed for treatment of women together under one umbrella, in supportive and warm atmosphere. The house staff consists of women only. It is a positive and stimulating model for any woman who wants to take part in life again. The house promotes a treatment plan dealing with femininity, partnership, motherhood, self-esteem and sexuality. Special emphasis is placed on PTSD treatment. The house is located in the city center allowing making use of the community's social, labor and medical services that are needed. Thus, during treatment the women are exposed to and have to cope with "real life situations". This presentation includes data, impressions and conclusions of the first six years the place has been operational.

#### **PRENATAL MARIJUANA EXPOSURE AND PTSD AMONG ADOLESCENTS**

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Prenatal marijuana exposure (PME) has been related to increased fearfulness in preschoolers, and to deficits in learning, memory, attention, and self-regulation among older children and adolescents. Imaging research has found deficits in response inhibition among PME-adolescents and young adults. Difficulties with memory, self-regulation, and response inhibition are key features of Posttraumatic Stress Disorder (PTSD), which is a maladaptive response to extreme or life-threatening trauma. Thus, there is reason to consider whether PME may be associated with PTSD. We examined the relation of PME to PTSD in 487 mother-child pairs using data from a longitudinal study. Marijuana, alcohol, and tobacco use were assessed prenatally. At 16 years, DSM-IV disorders were assessed in the women and their offspring using the Diagnostic Interview Schedule (C-DIS-IV). Risk factors for PTSD were identified from the literature and evaluated with logistic regression for inclusion in the model. PME was used as a continuous variable. The effects of PME were evaluated separately for each trimester. Covariates included race, gender, family income, IQ, maternal PTSD, and other prenatal exposures. 54% of the adolescents were African-American; their average age was 16.8 years (16-19) and 52% were girls. Mean family income was \$2118/month (\$0-9990). 81% of the adolescents were exposed to at least one PTSD-qualifying traumatic event. The lifetime prevalence of PTSD among the offspring was 6%. First trimester marijuana exposure (adjusted OR = 1.35; 95% CI 1.02, 1.77;  $p = .02$ ), lower IQ, female gender, and maternal history of PTSD predicted PTSD among the offspring. Prenatal marijuana exposure significantly increased the risk of having a PTSD diagnosis in this low-income sample of adolescents, controlling for other factors associated with PTSD. Further research is needed to replicate these results in other samples and to examine the mechanism by which PME may increase susceptibility to PTSD.

#### **A DESCRIPTION OF PREGNANT WOMEN SEEKING SUBSTANCE USE TREATMENT IN BALTIMORE, MD**

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The current study seeks to describe a sample of women seeking treatment for substance use at the Center for Addiction and Pregnancy (CAP) at the Johns Hopkins Bayview Campus in Baltimore, MD. The data is collected as part of an ongoing study aiming to reduce HIV risk behavior among pregnant women that abuse injection and non-injection drugs. To date, 89 women have been enrolled and 42 risk behavior and drug abuse assessments have been completed. The average age at intake is 29.6 years of age, with a range from 18 to 43. Fifty-one percent of women identify as white and 45% report African American ethnicity. More than half the sample (55%) did not complete high school or a GED program. The median age of first drug use was 15 years old. Of the 42 women, 29 had a history of using injection drugs. Of the women reporting injection drug use, nearly half had overdosed at some point in their life, 4 within a year of assessment. One finding of interest related to age at intake by race. African American ( $M=32.13$ ,  $SD=5.47$ ) women tended to be older than White women ( $M=27.67$ ,  $SD=5.40$ ) at age of intake ( $t=3.78$ ,  $p<.001$ ). There was no difference by race in age of first drug use. Further research may identify disparities in treatment availability and resource.

#### **PREDICTING CONTINUOUS ABSTINENCE OVER THREE YEARS AMONG FORMER POLYSUBSTANCE USERS: TOWARD A COMPREHENSIVE MODEL**

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Addiction is conceptualized as a chronic condition but research typically adopts a short term approach; this hinders the elucidation of sustained remission processes. We describe patterns of continuous abstinence over 3 years (stable remission or SR) and test a comprehensive psychosocial model to identify predictors of SR as a function of gender and of baseline remission 'stage' (> one year of abstinence and one year +). Former poly-substance users in remission from one month to 10+ years recruited from the community in NYC, mostly inner-city residents with long and severe history of crack or heroin use were interviewed 4 times at yearly interval (BL, F1, F2 and F3 -

preliminary full dataset N = 207, 44% women). Predictor domains: BL recovery promoting cognitions (e.g., motivation, self efficacy), spirituality, life meaning, overall quality of life satisfaction, social support and 12-step involvement, and continuous 12-step attendance over the 3 years. Fifty seven percent abstained from drugs continuously during the 3 years; SR likelihood was significantly associated with BL remission length (35% >one year BL remission, 77% in the one year + subgroup) but was not associated with other clinical or individual factors (e.g., dependence severity, gender, primary drug). For the total sample as well as for remission and gender subgroups, BL remission duration and continuous 12-step attendance over the 3 years were the only predictors of SR, the latter being associated with significantly greater likelihood of SR (e.g., for total sample, OR= 6.7, p<.001, 95%CI= 3.2-14.4). By including individuals with a broad range of BL remission durations and adopting a long term prospective approach, study findings extend knowledge on SR patterns among drug-dependent persons, and underline the need for clinicians to foster stable 12-step affiliation early on to maximize the likelihood that remission is attained and maintained. Funded by NIDA R01DA14409 and by the Peter McManus Charitable Trust.

#### **FACTOR ASSOCIATED WITH ANXIETY LEVELS FOLLOWING THE LEBANON WAR AMONG METHADONE MAINTENANCE TREATMENT PATIENTS IN TWO CLINICS IN ISRAEL**

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The hypothesis that stress and reaction to physical and emotional pain are linked to substance abuse and relapse, is supported by biological and brain research in humans and animals as well as by countless behavioral studies. From July to August 2006, during the war in Lebanon, the Haifa metropolitan area in northern Israel (population of about 1 million) was under constant rocket attacks. As a result of these attacks about 15 people were killed, hundreds were wounded and many buildings were hit. All services had to change their modes of operation and adjust to the emergency needs of clients and staff. Two Methadone maintenance outpatient clinics serving 700 clients operate in the Haifa metropolitan area. These clinics continued serving their clients during the war but were forced to drastically alter their mode of operation. All clients received Methadone once a week (6 take-home doses) and psycho-social services were rendered on an emergency basis only. This situation, regrettably, provided us with a unique opportunity to study the effects of such prolonged stress on Methadone maintained clients. Immediately following the end of fighting, questionnaires measuring anxiety were administered to 179 patients from 2 Methadone maintenance clinics (155 treated in Haifa, and 24 in Tel-Aviv, a city not exposed to direct threat). Higher anxiety levels were found in patients whose home was directly hit, followed by patients who were forced to reside in bomb shelters and by patients who were required to seek shelter when sirens were heard. Lowest anxiety scores were found in patients residing outside the range of rockets. Anxiety scores were also higher in women compared to men, and in the Arab population compared to the Jewish one. A significant increase in substance abuse was only found in patients whose homes were directly hit. Additional findings, as well as implications for practice will be presented.

#### **THE ASSOCIATION BETWEEN PARENTAL DRUG USE AND SEX TRADE AMONG DRUG-USING WOMEN**

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Studies investigating sex trade behavior have indicated parental abuse and neglect, drug abuse, and education level as common risk factors for sex trade involvement. However, few studies examine the role of parental drug use as a risk factor. The present study sought to examine the associations between sex trade involvement and parental drug use among a sample of 266 drug-abusing women from the Baltimore-metropolitan area, between the ages of 15 and 50, enrolled in the International Neurobehavioral HIV Study. Of the participants, 62.4% were African American and 37.6% were White, 35.7% of the women reported having sold sex for drugs or money. For African American women, parental drug use was associated with sex trade involvement. Binary logistic regression indicated that African American women involved in sex trade (OR = 3.07; 95% CI = 1.46; 6.49) were significantly more likely to have a drug using father than African American women who were not involved in sex trade. Specifically, 46.3% of the African American women involved in sex trade reported having a drug-using father compared to 22.6% who did not report having a father that used drugs. Education level and maternal drug use were not significant factors for African American women. For White women, education level was associated with sex trade involvement. White women who did not graduate high school were approximately 4 times more likely to be involved in sex trade (OR = 3.99; 95% CI = 1.58; 10.07) compared to White women who graduated high school. Specifically, 59.1% of White women who did not graduate high school were involved in sex trade compared to 21.7% of White women who did graduate. Parental drug use was not a significant factor for sex trade involvement among White women. The present study suggests that paternal drug use may be a risk factor for sex trade

involvement among African American women. Findings suggest HIV and substance use prevention interventions could benefit from addressing issues around parental substance use especially in African Americans.

#### **DIFFERENTIAL RISKS AND EXPECTATIONS: A COMPARISON OF MALE AND FEMALE COCAINE-DEPENDENT OUTPATIENTS ENTERING TREATMENT**

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**Objectives.** This study examined gender differences in demographics, psychopathology, and lifetime and current substance abuse in treatment-seeking cocaine dependent patients with the aim of highlighting male-female differences that may influence how treatment is accessed and experienced. **Methods.** Subjects were adult cocaine dependent outpatients who were being intaked into a treatment outcome study of psychosocial therapy. We included 2,376 subjects who had available data. Subjects were administered the Addiction Severity Index (ASI) and the Structured Clinical Interview for DSM-IV and various self-report measures. **Results.** More females were unemployed, received fewer years of education, and had dependent children compared to males. Females also had more severe medical, family, employment, and psychiatric problems on the ASI. Females were also more likely to have an anxiety disorder compared to males; however no other differences in Axis I disorders were found. Although there were no significant differences in current alcohol or drug use severity or lifetime cocaine use, males had higher lifetime use of hallucinogens, cannabis, and alcohol and had more severe intravenous drug use compared to females. Despite non-significant differences in current substance use, perceptions of current use differed by gender with males being more likely to perceive their cocaine use as affecting multiple life areas, including work, partners, and finances. Males also had more negative attitudes and expectations of treatment, such as having more negative expectations of improvement, less confidence in recommending treatment, and more negative views towards talking to a therapist. **Conclusions.** These findings suggest differential levels of psychosocial impairment, lifetime substance use, and treatment perceptions among males and females entering treatment, which may have important implications for treatment programs.

#### **REDUCING RISKY RELATIONSHIPS FOR HIV: DEVELOPING AN INTERVENTION FOR HI-RISK WOMEN**

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**Background:** Relationships are important to women (Staton Tindall, 2004) and women adapt their sexual behaviors to relationships (Morrill, et al., 1996). This presentation focuses on developing themes -- called Thinking Myths -- to target an intervention for drug using women. The intervention will help women recognize "risky relationships" to change their thinking and reduce their HIV risks. Grounded in the drug abuse, risky sex and decision making literature, the intervention targets are unique. **Methods:** As part of the first phase of developing, piloting, and testing the intervention for incarcerated women at community re-entry, 6 focus groups of 56 women were completed from July to December 2006. Focus groups were conducted with: Women in treatment who re-entered the community from prison (Residential Treatment - KY); Women in community treatment involved in the criminal justice system (Drug Court - KY); Women in prison-based drug treatment (KY); and Women in a transitional prison to community work release (DE). Focus group transcripts were analyzed, themes identified, and reviewed by research staff as well as an Expert Panel to develop Thinking Myths, which were further refined after piloting in prison-based treatment. **Results:** Seven Risky Relationship Thinking Myths were identified: 1) "Having sex without protection will strengthen my relationship." (Fear of Rejection); 2) "I only think good things about myself when I am in a relationship, even if it's risky." (Self-Worth); 3) "I can use drugs and still make healthy decisions about sex." (Drug Use); 4) "I know my partner is safe by the way my partner looks, talks, and/or acts." (Safety); 5) "I've been with this partner for a long time so there's no need to practice safe sex." (Trust); 6) "I will not get HIV because I'm not really at risk." (Invincibility); and 7) "I have to use sex to get what I want in a risky relationship." (Strategy/Power)."

#### **ABCBI GENETIC VARIABILITY AND OPIATE DEPENDENCE IN CAUCASIANS**

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The ABC transporter P-glycoprotein (Pgp) (*ABCBI*, *MDR1*) plays a key role at the blood-brain barrier by controlling the distribution of various substances, including opiates, to the CNS. A few common *ABCBI* variants have been shown to be associated with Pgp expression, drug response and disease susceptibility. Allele frequencies of those SNPs vary among different populations. The present study was designed to examine whether specific polymorphisms of the *ABCBI* gene are related to vulnerability to develop heroin dependence. For this purpose,

DNA samples from 496 Caucasian individuals (306 heroin-dependent individuals in methadone maintenance treatment, 190 individuals with no history of drug abuse ) were genotyped for 12 common SNPs (2 non-synonymous, 2 synonymous, 6 intronic ‘tag’ SNPs and 2 promoter variants). Six samples were excluded from final analysis because of genotyping failures or relations to another individual in the study. Genotype frequencies were in Hardy-Weinberg equilibrium. No significant differences in either allele or genotype frequencies were found between heroin dependents and controls. rs1128503 (1236C/T, G412G) showed marginal positive association with heroin dependence in females ( $p=0.048$ ), which is not significant after correction for multiple tests. Haplotypes and multi-locus genotype patterns were determined in all individuals, and no evidence for significant differences in haplotype or multi-locus genotype frequencies were found between heroin dependents and controls. Our findings suggest that *ABCB1* genetic variability is not related to the development of heroin dependence. Further studies will be necessary to confirm these findings and to extend the analysis to different ethnic groups and additional variants. Support: NIH-NIDA DA-P60-05130 (MJK); NIH-NIDA DA-00049 (MJK); UL1RR024143 (BC); the Dr. Miriam and Sheldon G. Adelson Charitable Foundation.

#### **SELF-REPORT OF PSYCHOPATHOLOGY IN A SAMPLE OF PREGNANT SMOKERS AND PREGNANT QUITTERS**

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The purpose of the current study was to evaluate self-reported psychopathology in a sample of pregnant women who either quit smoking or continued to smoke after learning of the current pregnancy. Prior research has shown that these two groups differ on demographic and socioeconomic factors. However, examination of whether they also differ in terms of clinically significant psychological symptoms, beyond depression, is generally lacking. To assess this, we used a comprehensive, empirically-validated instrument, the Adult Self-Report (ASR; Achenbach & Rescorla, 2003). The ASR uses standardized procedures to assess aspects of psychosocial functioning in alcohol use, tobacco use, other substance use, employment, and relationships with spouse, family and friends. Eight syndrome (e.g., anxious/depressed, withdrawn) scores are used to compute three broad-spectrum scores (internalizing, externalizing, and total score) in addition to an overall adaptive functioning score. Women who reported smoking at the time of conception completed the ASR prior to enrollment in either smoking cessation (pregnant smokers  $n=77$ ) or relapse prevention (pregnant quitters  $n=44$ ) studies. As expected, pregnant smokers were significantly younger at age of initiating smoking, were less educated, were more likely to be single, and were less likely to have private insurance. On the ASR, pregnant smokers were more likely to be in the clinical/borderline range for internalizing total score (27% vs. 12%) and adaptive total score (20% vs. 5%), whereas pregnant quitters were significantly more likely to be in the clinical/borderline range for alcohol use (9% vs. 24%). However, when logistic regression was used to control for potential confounding variables, current smoking status was a not significant predictor of being in the clinical/borderline ranges for any of the ASR scores, although a number of demographic variables were significant predictors. Continued evaluation of clinically significant psychopathology is needed to better understand the treatment needs of women who continue to smoke throughout their pregnancy.

#### **FACTOR ANALYSIS OF THE ALLEN BARRIERS TO TREATMENT INSTRUMENT WITH A CLINICAL SAMPLE OF FEMALE OUTPATIENT SUBSTANCE ABUSERS**

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One of the most robust findings in the substance abuse literature is women’s heightened vulnerability to the negative medical and social effects of substance abuse, and dependence. Increasing this risk is the finding that women are significantly less likely to seek treatment relative to the prevalence of drug abuse in the general population. And while men have historically been more likely to abuse drugs, gender differences in substance use patterns are decreasing. Whether the gap in treatment-seeking is also closing in is not known and serves as an impetus for research about patterns in gender differences. But when women do seek treatment they have better treatment outcome, are less likely to relapse, and have better long-term recovery outcomes than their male peers. A review of the published literature examining the barriers to treatment resulted in one measure, Allen Barriers to Treatment Instrument (ABTI), found to assess this construct in women. Goals of this study were: (1) to factor analyze the ABTI in a sample of treatment-seeking females ( $n= 77$ ) using Confirmatory Factor Analysis (CFA) of the empirical and conceptual factor structure (2) if a failure to confirm one of the a priori factor structures an exploratory factor analysis (EFA) of the ABTI will be required (3) to establish which questions load well on the factors described in the conceptual model and which questions do not perform well in the overall measure. Results suggest that Model suggested by Allen could not be confirmed in our CFA and the EFA suggested 3-factor solution, but is limited in its utility primarily due to factors 1 and 3 failing to produce adequate item loadings. Multiple recommendations for future research and analysis are discussed, including reworking items to clarify wording and eliminating items who do not contribute to the overall model or the conceptualized scales.

## **PERSONALITY AND PSYCHIATRIC CO-MORBIDITY DISCRIMINATES PATHOLOGICAL GAMBLERS AMONG SAME SEX SIB-PAIRS**

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Personality/ co-morbidity studies in pathological gambling focused on differences between pathological gamblers (PG)/ controls and provided important information on vulnerability factors for PG. No studies compared PG to their non-pathological gamblers relatives. Characterization of PG compared to NPG relatives could help identify within family vulnerability factors. Methods: Personality and psychiatric co-morbidity data from 74 same-sex sib-pairs were analyzed. Siblings (NPG) with any DSM-IV criteria for PG were excluded. Psychosis/ neurological diseases (assessed through SCAN) were exclusion criteria. Subjects completed Temperament and Character Inventory - TCI/ Barrat Impulsiveness Scale - BIS. Results: Variables that entered discriminant analysis ( $p>0.1$ ): male pairs: nicotine/ alcohol dependence, SCAN anxiety/ depression scores, impulsiveness, disorderliness, shyness, fatigability, attachment, dependence, persistence, responsibility, purposeful, resourcefulness, self-acceptance, congruent 2nd nature, social acceptance, empathy, helpfulness, revengefulness, self-serving, total BIS ; female pairs: nicotine dependence, lifetime depression, SCAN anxiety /depression scores, impulsiveness, extravagance, disorderliness, harm avoidance, attachment, dependence, self-directedness, cooperativeness, self-forgetful, total BIS. 90.5% of male PG were correctly classified by nicotine dependence/ higher depression scores; higher impulsiveness/ extravagance; lower responsibility. 98.6% of female PG were correctly classified by nicotine dependence, higher depression scores; higher extravagance/ persistence; lower attachment/ self-directedness. Conclusions: PG had higher rate of nicotine dependence compared to NPG. Previous studies reported common genetic vulnerability for nicotine dependence/depression/ PG in males. We hypothesize that this finding could be true for females. Personality profile of PG suggests traits of impulsive personality.

## **GENDER DIFFERENCES IN THE EARLIEST STAGES OF DRUG INVOLVEMENT IN BOGOTÁ, COLOMBIA**

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Background: There is evidence that gender differences in the prevalence of reported drug use can be attributed, at least in part, to differences in the likelihood of having experienced an exposure-opportunity (E-O). Little is known about early stages of drug involvement in young men and women in Colombia - one of the world's leading drug producing countries. Objective: To examine gender differences in E-O prevalence, and in the likelihood of transitioning from E-O to use, among a representative sample of school-attending adolescents. Methods: Data was collected via a standardized questionnaire administered to 1230 school students in Bogotá, Colombia, selected in a stratified multistage probability cluster sample. Results: Males were significantly more likely than females to report an E-O for tobacco (Odds Ratio=1.3, 95%CI=1.1,1.6), marijuana (OR=1.6, 95% CI=1.3,2.0), inhalants (OR=1.5, 95%CI=1.2,1.9) or any illegal drug (e.g., marijuana, cocaine/coca paste, ecstasy or opiates) (OR=1.4, 95%CI=1.2,1.7). Given an opportunity, young men were more likely to report transition to use for alcohol (OR=3.9, 95%CI=1.9,8.0), inhalants (OR=2.4, 95%CI=1.6,3.7) and cocaine/coca paste (OR=3.1, 95%CI=1.6,7.5). Females were more likely to report intention to use any illegal drug within the next 12 months (OR=2.1, 95%CI=1.7,2.6); this association was attenuated somewhat among students with low parental control (OR=1.5, 95% CI=1.0,2.2). Conclusions: Consistent with results observed in other studies, young men are more likely than their female peers to experience an E-O to use a variety drugs, while gender differences in transition from E-O to actual use are more complex. Given an opportunity young women are equally likely to use tobacco, marijuana, ecstasy and any illegal drug, and less likely to transition to the use of alcohol, inhalants and cocaine/coca paste. Identifying and understanding gender differences in the earliest stages of the drug use involvement continuum will help guide development of gender-specific prevention activities.

## **INCREASED RISK AMONG TRAVELING YOUNG INJECTION DRUG USERS**

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BACKGROUND: Young injection drug users (IDU) are at high risk for bloodborne infections and are in a window of opportunity for disease prevention. However, many young IDU travel frequently, impeding prevention efforts. We hypothesize that those who travel engage in higher risk injecting and sexual behavior compared to those who are geographically stable. METHODS: We conducted a cross-sectional study of young active IDU recruited via street outreach in San Francisco, 2004-2006. Subjects completed an interviewer-administered survey and testing for HIV, HCV and HBV. We conducted contingency table analyses and logistic regressions to determine whether travel is an independent predictor of risk behavior. RESULTS: Median age was 22 (IQR 20-24), 75% were white, and 71% were male. Median days injecting in the last month was 18 (IQR 8-30) and 27% had injected daily. 63% had traveled outside San Francisco in the last 3 months. Compared to those who remained in San Francisco,

travelers were younger (22% vs. 13% < age 20,  $p=0.03$ ) and more likely to be female (31% vs. 22%,  $p=0.03$ ) but similar in years injecting (median 4 vs. 5,  $p=0.57$ ). Travelers also were more likely to drink heavily (52% vs. 14%,  $p<0.01$ ), including drinking to blackout (36% vs. 14%,  $p<0.01$ ), use crack cocaine (57% vs. 46%,  $p<0.04$ ), pool money to buy drugs (86% vs. 66%,  $p<0.01$ ), inject with  $\geq 5$  people (60% vs. 41%,  $p<0.01$ ), share drug preparation equipment (67% vs. 48%,  $p<0.01$ ), inject with a used syringe (52% vs. 38%,  $p<0.01$ ), and have > 1 sex partner (58% vs. 38%,  $p<0.01$ ). These differences persisted after adjusting for age, sex, and race in logistic regressions (all  $p<0.05$ ). Travelers were equally likely as non-travelers to report inconsistent condom use (76% vs. 78%,  $p=0.76$ ) and had similar prevalence of anti-HCV (35% vs. 31%,  $p=0.46$ ). Travelers were less likely to have injected daily in the prior month (23% vs. 34%,  $p=0.03$ ). CONCLUSIONS: Traveling young IDU are at exceptional risk for bloodborne infections due to increased injecting and sexual risk behavior and for the sequelae of heavy alcohol use. Risk reduction strategies must account for their lack of geographic stability.

#### **SEX DIFFERENCES IN MOTIVATION TO SELF-ADMINISTER COCAINE DURING THE TRANSITION FROM ADOLESCENCE TO ADULTHOOD IN RATS**

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Previous work has shown that adult female rats are more sensitive than adult male rats to the reinforcing effects of cocaine, an effect that appears to be due, at least in part to ovarian hormones. Here we examine sex differences in cocaine self-administration during adolescence, a period of marked hormonal change. Intact adolescent male and female Sprague Dawley rats were trained to self-administer cocaine (0.75 mg/kg/infusion) under a fixed ratio 1 schedule (i.e., each response produced an infusion of cocaine) beginning on postnatal day 30. Following acquisition of cocaine self-administration (defined as 2 consecutive sessions during which a rat obtained all 20 infusions available), responding was assessed under a progressive ratio schedule in order to assess sex differences in motivation for cocaine. Female rats acquired cocaine self-administration in fewer sessions as compared to male rats. Under progressive-ratio testing conditions, adolescent female rats responded at higher levels to obtain cocaine infusions as compared to male rats. However, sex differences were more robust at the end of adolescence (i.e., around day 42). These findings suggest that sex differences are relevant during adolescence. Studies are underway to determine the relationship between gonadal hormones (i.e., estradiol, progesterone, and testosterone) and motivation for cocaine during this important hormone transition period.

#### **AN ANALYSIS OF THE PREVALENCE AND PERSISTENCE OF PSYCHOTIC BEHAVIORS IN COCAINE- VS. METHAMPHETAMINE-DEPENDENT PARTICIPANTS**

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The purpose of this study is to compare and contrast the psychotic symptom profiles (using the Psychotic Symptom Assessment Scale) reported by stimulant users. Participants included 42 cocaine-dependent (27M, 15F) and 43 methamphetamine (MA)-dependent (25M, 18F) individuals. Overall, >40% of both cocaine- and MA-dependent users reported delusions of paranoia and auditory hallucinations. MA-dependent men were more likely than cocaine-dependent men to report that they have seen or felt things that others could not" ( $p<0.01$ ), and that "someone/thing has external control over your actions" ( $p<0.05$ ) during the drug abstinent condition. When intoxicated, MA-dependent men were more likely than cocaine-dependent men to report "feeling as if an organization is conspiring against you" ( $p<0.05$ ), "seen or felt things that others could not" ( $p<0.001$ ), and "smelled things others could not" ( $p<0.05$ ). When abstinent, MA-dependent women were more likely than cocaine-dependent women to report "having special powers" ( $p<0.05$ ). During intoxication, MA-dependent women were more likely than cocaine-dependent women to report "feeling strange sensations" ( $p<0.05$ ). During the drug abstinent condition, MA-dependent females were more likely than MA-dependent males to report "small things that others could not" ( $p<0.02$ ). During intoxication, MA-dependent women were more likely than MA-dependent men to report "having special powers" ( $p<0.04$ ). During the drug abstinent condition, cocaine-dependent females were more likely than cocaine-dependent males to report "hearing noises that others could not" ( $p=0.05$ ). During intoxication, cocaine-dependent women were more likely than cocaine-dependent men to report "imagine someone touching you" ( $p<0.001$ ), and "smell things other could not" ( $p=0.05$ ). In summary, the symptoms recorded provide insights into different profiles of psychosis that emerge after use of these distinct stimulants. Support provided by NIDA: DA014593, DA017182, DA17705, DA17754."

### **EFFICACY OF A COCAINE VACCINE FOR THE TREATMENT OF COCAINE DEPENDENCE IN METHADONE-MAINTAINED PATIENTS**

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A 20 week randomized double-blind placebo-controlled trial of a cocaine vaccine in 114 cocaine dependent methadone patients. Gave 5 vaccinations over 12 weeks. Patients were followed for safety and tolerability end-points up to 9 months. Intent to treat (ITT) analysis of thrice weekly cocaine urine toxicologies used Piecewise random regression analyses. Results: 109/114 received all five vaccinations. Of the 114 ITT, 66% were male and 86% Caucasian. The vaccine was well tolerated, with some erythema and tenderness at the injection site. Treatment-emergent or associated events were not more common in the vaccine group. The maximum mean antibody response occurred at 4 weeks and persisted for at least 12 weeks for the vaccine group. During the first 10 weeks of treatment, the vaccine group showed a significantly better rate of achieving cocaine abstinence than the placebo group ( $p < 0.01$ ). However, from weeks 11-20 the rate of cocaine usage in the vaccine group increased substantially, whereas the placebo group's overall abstinence did not change. Further analysis is needed to tease out these group differences. 35 cocaine vaccine subjects had a booster vaccination after 6 months and had an antibody titer rise as a result. Conclusions: The cocaine vaccine appears safe and effective. Specific cocaine antibodies persisted at least 12 weeks. Vaccine recipients demonstrated a greater rate of achieving abstinence than the placebo group, which correlated with highest antibody titer levels. (Supported NIDA U19-DA10946, P50-DA12762, K05-DA0454(TRK)).

### **GENDER DIFFERENCES IN CONDITIONAL SUBSTANCE DEPENDENCE BY PSYCHIATRIC DIAGNOSIS IN THE U.S. POPULATION**

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Background: Little is known about gender differences in the association of psychiatric comorbidity with the proportion of substance users who develop dependence on that substance (conditional dependence, CD). Objectives: Evaluate the association of gender and psychiatric comorbidity with conditional dependence. Method: Secondary analysis of data from 43,093 non-institutionalized US adults in the first wave (2001-2002) of the National Epidemiological Survey on Alcohol and Related Conditions. A structured diagnostic interview allowed classification by lifetime psychiatric diagnosis (DSM-IV criteria) and psychoactive substance use. Data were analyzed using weighted proportions, 95% CIs, and weighted logistic regression models to generate odds ratios (OR). Results: Among males, presence of any psychiatric disorder was associated with greater prevalence of tobacco, marijuana, cocaine, and hallucinogen CD than was having no disorder; presence of schizophrenia was associated with greater prevalence of alcohol CD. Among females, presence of any psychiatric disorder was associated with greater prevalence of marijuana, cocaine, tranquilizer and opioid CD than was having no disorder; presence of schizophrenia was associated with greater prevalence of tobacco and alcohol CD. Among respondents with mood disorders, males were more likely than females to have alcohol, marijuana, and hallucinogen CD ( $OR \geq 1.8$ ); females were more likely to have amphetamine CD ( $OR = 1.6$ ). A similar pattern of gender differences held for respondents with anxiety disorders. Among respondents with schizophrenia, males were more likely than females to have alcohol CD ( $OR = 1.8$ ); females were more likely to have amphetamine CD ( $OR = 6.5$ ). Conclusion: Psychiatric comorbidity is associated with greater prevalence of CD on most substances. Patterns of substance CD vary by gender and by psychiatric diagnosis in the U.S. non-institutionalized adult population. Supported by the Intramural Research Program, NIH, NIDA and grant DA-020923(SSM).

### **CLUSTERING OF HIGH-RISK SEX BEHAVIORS AMONG MEN AND WOMEN DRUG USERS**

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Introduction: Between June 2003 and March 2006, the University of Miami conducted a prospective study among drug users to examine the efficacy of two intervention programs to reduce sexual behaviors that place individuals at high risk for the transmission of HIV. Primary results have been presented (1). We report on an analysis of the extent to which high risk behaviors tend to cluster. Hypothesis: High risk behaviors around crack use differ from those around injection drug use. Procedures: HIV risk variables from 491 drug users (273 men and 218 women) were analyzed using principal components factor analysis with varimax rotation; separate analyses were done for men and women. All variables measured behavior in the 30 days prior to baseline interview. Results: For men, three factors were identified, accounting for 21%, 19% and 16% of the variance respectively. The first loaded with crack use and negatively with injection drug use; the second, with number of acts of vaginal intercourse and percent of time a condom was used; and the third, with having casual sex partners, number of sex partners, and

number of days involved in the sex trade. Two factors emerged for women, accounting for 28% and 18% of the variance respectively. The first loaded with number of sex partners, number of acts of vaginal intercourse, number of days involved in the sex trade, and percent of time a condom was used; and the second, with crack use, having a casual partner, and negatively with injection drug use. Conclusion: Risk behaviors appear to cluster differently for crack users and injection drug users; the latter tend to have more partners and acts of intercourse. Furthermore, risk behaviors cluster differently for men and women. (1) McCoy et al. 2005. Are standard interventions actually effective in reducing HIV risk among chronic drug users? Presented at the CPDD 2005 Annual Meeting, June 18 - 23, Orlando, FL.

#### **FEMALE IDUs' SEX WORK AND DIMINISHING SOCIAL SUPPORT: TANZANIAN WOMEN'S INDEPENDENCE AND ISOLATION**

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Unlike female IDUs in other countries, female IDUs in Dar es Salaam, Tanzania are more likely to operate and function independently of male companions, and this independence costs them important social connections. The Tanzanian AIDS Prevention Project uses mixed methods, including 94 in-depth interviews with 38 female and 56 male IDUs between February 2003 and December 2006 that elicited thick descriptions of Tanzanian IDUs' ideas and drug and sexual practices. Verbatim transcribed interviews and media reports were analyzed in ATLAS.ti using the constant comparative method. While some girls and women reported initiating heroin use with a boyfriend or husband, arrests due to their drug related activities generally ended relationships. Once a main male partner was arrested, Tanzanian female IDUs began developing stronger relationships with other female IDUs. Many female IDUs in Dar es Salaam room together, eat together, go on the streets to engage in sex work together, and inject together. Yet they are precariously housed. The stigma associated with sex work and with drug use led them to disassociate with their families. By 2006, female IDUs engaged in sex work regularly earned an income at rates five times the minimum monthly wage of approximately US\$50. The 219 female IDUs in our survey (n=537) were twice as likely to HIV positive than male IDUs (64% of the women). Although independent, sex work exposes female IDUs to violence and disease and alienates them from their families. Interventions designed to help female IDUs reconnect with their families and the larger community are sorely needed as are training opportunities that will provide them with sustainable livelihoods. Funded by the NIDA International Program collaborative research supplement (NOT-02-003) and a subsequent R21 (DA19394).

#### **PSYCHIATRIC SYMPTOM IMPROVEMENT IN WOMEN FOLLOWING GROUP SUBSTANCE ABUSE TREATMENT: RESULTS FROM THE WOMEN'S RECOVERY GROUP STUDY**

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The Women's Recovery Group (WRG) study is a Stage I clinical trial comparing a new manual-based group treatment for women with substance use disorders with Group Drug Counseling (GDC). In this analysis, data from the WRG study was examined to determine whether co-occurring symptoms of depression and anxiety would improve with treatment and whether these improvements would demonstrate durability over the follow-up period. The sample consisted of 36 women who received the WRG (n=29) or GDC (n=7) treatments. The Beck Depression Inventory (BDI) and the Beck Anxiety Inventory (BAI) were used as self-report measures of symptoms of depression and general anxiety. The psychiatric composite score from the Addiction Severity Index (ASI) was also examined as a measure of symptom severity. Symptom reduction was measured as changes from baseline to the end of treatment and 3 and 6 months post-treatment. Repeated-measures ANOVAs were conducted comparing symptom reduction in the two treatment conditions and no significant differences were found. ANOVAs were re-run with treatment condition collapsed to examine within-subjects change. Analyses demonstrated a significant effect of time on outcome for the BDI,  $F(3,81) = 4.61, p < .01$ , the BAI,  $F(3,81) = 2.71, p < .05$ , and the ASI psychiatric composite score,  $F(3,81) = 4.07, p < .01$ . This analysis demonstrated significant psychiatric symptom reduction for women within a substance abuse treatment protocol that remained durable through 6 months post-treatment. Due to the small sample size, the ability to detect differences among those with and without baseline psychiatric diagnoses is limited. With the high prevalence of co-occurring substance use and psychiatric disorders in women, and their importance in relapse and recovery, the nature of psychiatric symptom change in substance abuse treatment should be further explored in order to elucidate the relationship between these disorders and to maximize treatment efficacy.



## **PREFRONTAL CORTEX MORPHOMETRY IN ABSTINENT ADOLESCENT MARIJUANA USERS: SUBTLE GENDER EFFECTS**

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**INTRO.** Adult human studies suggest frontal dysfunction associated with chronic marijuana use (Loeber & Yurgelun-Todd, 1999). However, due to neuromaturational processes that occur during adolescence, adult studies cannot necessarily be generalized to adolescents. Despite the high prevalence of marijuana use among youth, few studies to date have examined brain volume changes associated with marijuana use during adolescence. The primary goal of this study was to characterize the effects of chronic marijuana use on prefrontal cortex (PFC) morphometry following one month of monitored abstinence in adolescents. Other potentially important factors, such as gender and alcohol use, were also explored. **METHOD.** Data were collected from marijuana users (n=16) and controls (n=16) aged 16-18. Extensive exclusionary criteria included premorbid psychiatric and neurologic disorders. Substance use and anatomical measures were collected after 28 days of monitored abstinence. Reliable raters obtained prefrontal lobe volumes (including dorsal, ventral, and total PFC regions) by manual tracing on high resolution magnetic resonance images. **RESULTS.** After controlling for lifetime alcohol use and intracranial volume, there were no significant group differences in PFC volume. Marginal group-by-gender interactions were observed in the posterior ( $p<.09$ ) and total ( $p<.10$ ) PFC regions. Specifically, female marijuana users demonstrated comparatively larger PFC volumes than female controls, while male marijuana users had smaller volumes compared to male controls. **CONCLUSION.** The primary results indicated that following one month of abstinence, adolescent marijuana users do not significantly differ in PFC volume compared to controls. However, these preliminary results indicate that gender may moderate the relationship between chronic marijuana use and PFC morphometry during adolescence. Future research will include measuring PFC gray and white matter separately and conducting longitudinal research to study the impact of gender and marijuana use on neurodevelopment.

## **“THE FEMALE STEP” - MEDICAL-SOCIAL DAY CENTER FOR DRUG-ADDICTED PROSTITUTES**

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The Tel Aviv central bus station, constitutes a critical turning point in the challenge facing Israeli treatment officials, due to the fact that it is the only occupied territory" in the country. This is well-known phenomenon encountered in the international literature found mainly around the central stations in big cities and has several characteristic features: the presence of a large concentration of drug addicts, drug-related activities without fear of law enforcement officials and without consideration for the local population. Because of the fact that daily some 500 drug addicts gather at the compound, the Israel Anti-Drug Authority established, a center called "First Step" that is managed by a former drug addict. The center is a meeting place for the compound population which, besides receiving an attentive ear and a hot drink, is referred to fast-track treatment, social services, free restaurants and clothing storeroom. In the evening hours there is a needle exchange program. Since prostitution is rife in the central station area, the Ministry of Health maintains a clinic for sexually transmitted diseases at the location with the aim of reducing morbidity from STDs. Their joint field activities lead the two teams to establish a unique outreach project for prostitutes. There is a fixed reception day at "First Step", on which the women receive a warm supper, and can take a shower, change clothes, relax in a room and join a support group. coordinated by a social worker and supervisor (a clean ex-addict and ex-prostitute). The women receive support for positive changes in their lives and help for immediate admission to detoxification programs. The group is of the "revolving door" type. The project is aimed at bringing the women to "the female step", i.e., recognizing their ability to kick-off and improve their health by using existing treatment facilities. This presentation deals with the development, impressions and data of the project."

## **ACUTE EFFECTS OF PROGESTERONE AND TESTOSTERONE ON COCAINE SELF-ADMINISTRATION BY FEMALE NONHUMAN PRIMATES**

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Gonadal steroid hormones appear to modulate some of cocaine's behavioral effects in preclinical studies, and progesterone attenuates cocaine's abuse-related effects in women and in rats. The present study examined the effects of acute administration of progesterone and testosterone on cocaine self-administration by female rhesus monkeys. We studied the effects of single doses of progesterone (0.1, 0.2 and 0.3 mg/kg, i.m.) and testosterone (0.001, 0.0032 and 0.01 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. Monkeys also worked on the same operant schedule

for 1g banana-flavored food pellets in 3 one-hr daily sessions. Cocaine doses were administered in an irregular order during each dose-effect curve determination, and the same dose order was used in an individual monkey in all treatment conditions. Progesterone or testosterone was administered before each test session, twice each week on Tuesday and Friday. Blood samples for hormone analysis were collected at the end of each test session. Progesterone (0.2 and 0.3 mg/kg, i.m.) produced a dose-dependent downward and rightward shift in the cocaine self-administration dose-effect curve (N=4). Similar effects were observed after testosterone (0.001-0.01 mg/kg, i.m.) treatment (N=4). These preliminary results are consistent with clinical reports that progesterone administration may decrease ratings of positive subjective effects of cocaine in women. This research was supported in part by R01-DA14670, P01-DA14528, K05-DA00101 and K05-DA00064 from the National Institute on Drug Abuse, NIH.

#### **PREVALENCE AND CORRELATES OF MOOD DISORDERS AMONG SUBSTANCE-DEPENDENT PREGNANT WOMEN IN TREATMENT**

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**Background.** Pregnant women using illicit drugs are at heightened risk for postpartum outcomes with devastating consequences for mother and child, including substance use, psychiatric illness, and infectious disease. Relatively little is known about mood disorders in this population, although mood disorders may be associated with more severe substance use, treatment drop-out, and poorer postpartum prognosis. This study assesses mood disorder prevalence among drug-dependent pregnant women in substance abuse treatment. Mood disorder prevalence is predicted to be high in this population and to be associated with polydrug dependence, one marker of substance use severity. **Methods.** Participants are recruited from the Johns Hopkins Center for Addiction and Pregnancy, which provides substance abuse treatment to pregnant women. Participants are administered the Structured Clinical Interview for DSM-IV Mood and Substance Use Disorders. Data are reported for an initial subsample of 34 participants for whom interviews have been completed. **Results.** Participants' average age was 29.6, and 96.5% had 12 or fewer years of education. 50.6% of participants self-identified as White and 44.9% as African American. Seventeen women (50%) met criteria for current opioid dependence, 12 (35.3%) for cocaine dependence, 1 (2.9%) for alcohol dependence, and 13 (38.2%) for polydrug dependence (> 2 substance use disorders). Eleven women (32.4%) met criteria for lifetime mood disorder and 5 (5.6%) for current mood disorder. Women with a current mood disorder were more likely to meet criteria for polydrug dependence (OR=10.00; C.I.: 0.96, 103.78; p=.05). **Conclusion.** Mood disorder prevalence was high: 32.4% in this sample, compared with 17.1% among the U.S. female population (Hasin, Goodwin, Stinson, & Grant, 2005). Mood disorders were also associated with polydrug dependence, indicating a complex and severe substance use profile. This study has implications for identifying a very high risk perinatal subgroup, a critical step toward improving interventions.

#### **CHILDHOOD ADVERSE EVENTS AND CURRENT TRAUMATIC DISTRESS: A COMPARISON OF MEN AND WOMEN PRISONERS**

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A considerable amount of research over the past decade has shown that incarcerated women have extensive histories of emotional, physical, and sexual abuse, often leading to chronic drug abuse and coexisting mental and physical health problems. However, whether there are similar histories and the resulting effects among male offenders has not been explored. The purpose of this study was to describe the prevalence of multiple types of childhood adverse events (CAEs) among men and women prisoners, and assess the relationship of cumulative adverse childhood events to adult symptoms of traumatic distress. In-depth baseline interview data for 427 men and 315 women participating in the California Department of Corrections and Rehabilitation Treatment Expansion Initiative was analyzed assessing childhood abuse and household dysfunction, drug use and criminal histories, family background, and current symptoms of traumatic distress. Our hypotheses were supported and results showed that our sample of women offenders had greater exposure to CAEs than the sample of men (23% of the women reported >5 CAEs vs. 13% of the men). Although women reported higher rates of abuse and higher rates of current traumatic distress, regression results showed that the impact of CAEs on current symptoms of traumatic distress was strong and cumulative for both men and women (greater exposure to CAEs significantly increased the likelihood of 6 out of 7 mental health outcomes). The finding that mental health problems of this population of male and female offenders may have their origins in childhood events indicates the need for early prevention and intervention, as well as appropriate trauma-based treatment within the correctional setting for both men and women.

## **PSYCHOPATHOLOGY AS MEDIATOR IN THE PREDICTION OF SUBSTANCE USE BY PARENTAL CHILD ABUSE POTENTIAL IN GIRLS**

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This study tested the mediation role of CBCL externalizing (EXT) and internalizing (INT) behaviors in the association between maternal and paternal potential for child abuse and number of psychoactive substances ever used (SU) from ages 10-12 to 12-14 controlling for parental substance use disorder (SUD) and socioeconomic status (SES) in daughters of SUD and non SUD fathers. The daughters of SUD fathers (n=86), compared to daughters of non SUD fathers (n=97), displayed higher scores for EXT and INT behaviors ( $p<.000$ ) as well as paternal ( $p<.001$ ) and maternal ( $p<.001$ ) potential for child abuse. Also, the daughters of SUD fathers had a lower SES ( $p<.001$ ). Participants (n=136) versus non participants (n=47) at follow-up did not differ with respect to demographics. However, the non participants had higher scores on INT behavior ( $p<.01$ ) and paternal potential for child abuse ( $p<.01$ ). The results of the MPlus showed that (1) the model and the data had a good fit (Chi Square=6.37,  $df=9$ ,  $p=.70$ , RMSEA=.86) and (2) INT and EXT did not mediate the association between paternal and maternal potential for child abuse and daughter's SU from ages 10-12 to 12-14. The results of the direct pathways showed that paternal SUD, maternal SUD, and daughter's EXT behavior predicted daughter's SU from ages 10-12 to 12-14. Also the results showed that at age 10-12 (1) both, maternal SUD and potential for child abuse predicted daughter's INT behavior and (2) SES and maternal potential for child abuse predicted daughter's EXT behavior. These results suggest that (1) young girls with SUD parents displaying EXT behavior are at an increased risk for SU during early adolescence and (2) intervention programs directed at preventing early SU in girls should include treatment of their EXT behavior and both parents' SUD.

## **EARLY POSTNATAL STRESS, AS MODELED BY MATERNAL SEPARATION, ALTERS MORPHINE-INDUCED CONDITIONED PLACE PREFERENCE IN MALE OFFSPRING, BUT NOT IN FEMALES**

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Clinical literature has established a link between early childhood incidents of neglect and trauma and adult problems with substance abuse. In rats, such early-life stress has been modeled using a maternal separation (MS) paradigm in which rat pups are removed from their mothers for a few hours daily during the first 2 postnatal weeks. In this study we used the MS model to investigate the effects of early postnatal stress on morphine-induced conditioned place preference (CPP) in male and female Long-Evans rats. Offspring of both rearing conditions (MS or nonhandled, NH) were conditioned using a biased procedure and saline or morphine (3.0, 5.6, 10 mg/kg, SC) for three days followed by a drug-free CPP test 24 h later. Morphine was given 30 min prior to confinement in the non-preferred compartment; saline was given in the same manner before confinement in the preferred compartment. MS males spent significantly more time in the morphine-paired compartment at all doses compared to NH males. There was a significant sex effect amongst the MS offspring, with males spending a greater amount of time in the morphine-paired compartment. Rearing did not appear to alter CPP in females, while sex appeared to have little effect on place preference in NH offspring. These findings indicate that early postnatal stress can significantly enhance morphine-induced CPP in a sex-dependent manner, apparently by increasing the rewarding value of morphine in male offspring more than in females. This research was supported by N.I.H. grant DA00541.

## **THE EFFECTS OF PRENATAL COCAINE AND LEAD EXPOSURE ON SUBSTANCE USE RISK IN 11-YEAR-OLD CHILDREN USING THE ALEXSA**

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Children prenatally exposed to cocaine (C+) may be at risk for substance abuse due to negative biologic and environmental factors. A computerized, self assessment, of substance use and related liability factors for children (8-13 years), the ALEXSA, was given to 108 C+ and 114 C- 11 year old urban, low SES subjects participating in a longitudinal study of prenatal cocaine exposure. Subscales of the ALEXSA assess substance use, conduct, depression, irritability, social disinhibition, thrill and adventure seeking, tolerance of deviance, impulsiveness, inattention, academic competence, and parental attachment and permissiveness. Group comparisons were made using t-tests for continuous data and chi square analyses for categorical variables. Linear regression, controlling for confounding factors, was used to evaluate the relationship of cocaine exposure to ALEXSA subscales. Groups were not different for the % of children who tried alcohol (10.2% C+ vs. 7.9% C-), tobacco (4.0% C+ vs. 0% C-), marijuana (0% C+ vs. .9% C-), or hard drugs (.93% C+ vs. .88% C-). There were no cocaine effects for any of the substance abuse risk factors. Among C+ children, there was a trend for placement in foster or adoptive care to be associated with greater irritability compared to C- children in biologic/relative care ( $p<.07$ ). Higher average prenatal alcohol exposure was associated with lower academic competency ( $p < .04$ ) and less parental attachment ( $p < .01$ ). Higher 3rd trimester marijuana exposure was associated with lower social disinhibition ( $p<.04$ ). Better

quality HOME environment was related to lower conduct disorder ( $p < .02$ ), depression ( $p < .05$ ), and irritability ( $p < .01$ ). Environmental lead was not associated with any of the ALEXSA risk factors. Prenatal exposure to marijuana and alcohol are associated with some early risks factors for substance abuse, while prenatal cocaine exposure was not.

#### **GENDER DIFFERENCES IN PERCEIVED VULNERABILITY TO HIV INFECTION**

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This study examined the associations between risky behaviors, executive functioning and perceptions of risk of contracting HIV. The sample included injection and non-injection drug users from the International Neurobehavioral HIV Study, an epidemiological examination of neuropsychological, social, and behavioral risk factors of HIV, HAV, HBV, and HCV. The sample of the present study included 471 drug users who were either African American or white and had valid responses on the items of interest. Risky behaviors included drug use, casual sex, and commercial sex and were trichotomized into no risk, low risk, and high risk based on needle sharing behavior and condom use. Covariates included age, ethnicity, gender, education, homelessness, knowing someone who was HIV positive, knowing someone who had died from AIDS, and knowledge of HIV transmission routes. Results of separate logistic regression analyses for males and females indicated that males were more likely to perceive vulnerability to HIV due to high risk drug use (AOR = 4.49, 95% CI = 2.30-8.76), while females perceived vulnerability to HIV from low and high risk casual sex (AOR = 3.28, 95% CI = 1.34-8.03 and AOR = 3.43, 95% CI = 1.57-7.50, respectively). Executive functioning was not significantly associated with perceived risk. These results can be used to target groups of people for HIV prevention efforts. For example, people who have greater perceptions of vulnerability may be more motivated to protect themselves from disease, especially from sources such as high risk drug use or casual sex.

#### **STRESS, COPING, AND WELL-BEING AMONG FAMILY MEMBERS OF WOMEN WITH SUBSTANCE USE AND PSYCHIATRIC DISORDERS**

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Hypotheses: The effects on family members of women's substance use or co-occurring psychiatric and substance use disorders were examined, and the mediating or moderating role of family member adaptive or maladaptive coping strategies was assessed. Methods: 82 women in inpatient or outpatient treatment for substance use disorders and 82 family members were interviewed. Most frequent substance use disorders were cocaine, alcohol, or marijuana dependence. 56 women also met diagnostic criteria for one or more additional psychiatric disorders: major depression, dysthymia, posttraumatic stress disorder, mania, hypomania, or generalized anxiety disorder. Measures were the Computerized Diagnostic Interview Schedule (C-DIS), Client Behaviors Scale, Brief COPE, Family Experiences Interview Schedule (Worry, Displeasure, Stigma, and Impact subscales), and the Center for Epidemiological Studies Depressive Mood Scale (CES-D). Results: Findings of multiple regression analyses were that client behavioral problems and extent of client drug or alcohol use were significantly related to greater family member burden. At the bivariate level, greater client behavioral problems were also related to higher levels of family member depressive symptomatology. Family member maladaptive coping was found to completely or partially mediate the relationships between client behavioral problems and extent of client drug or alcohol use and family member Stigma and Frequency of Impact. Maladaptive coping also functioned as a moderator between extent of client drug or alcohol use and family member Impact. Adaptive coping was a partial mediator between client behavioral problems and family member Worry. Conclusions: Stressors related to substance use and psychiatric problems had multiple negative impacts on family members that were mediated predominantly by family member maladaptive coping. Family member coping may also affect outcomes for women receiving substance abuse treatment.

**THE PREVALENCE OF DEPRESSION SYMPTOMS IN A POPULATION ATTENDING A TOBACCO TREATMENT PROGRAM IN BRAZIL**

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**AIM:** In this study on smoking cessation treatment patients in Brazil, the question involves estimation of associations linking tobacco dependence with depressed mood, and the possibility of male-female differences in the observed association. **METHODS:** The study sample consists of all 255 patients (mean age 46; 69% women) who attended a behaviorally oriented tobacco treatment program in one of Brazil's public drug treatment centers. Baseline evaluation included the Beck Depression Inventory (BDI) and the Fagerstrom Test for Nicotine Dependence (FTND). Proportions (Pr) have been estimated, with the chi-square to derive p-values. **RESULTS:** A large proportion (75%) had FTND-assessed moderate-high levels of nicotine dependence (ND), and ~40% had BDI depressed mood (DM) scores above a 19-point cutoff threshold, with excess levels of depression among women as compared to men. ( $p < 0.05$ ). At these cutoff scores, the ND-DM association was statistically robust ( $p < 0.05$ ), and was stronger for the women than for the men: among women with low nicotine dependence levels, only 24% had moderate-severe depressed mood (BDI > 19), but among those with moderate-severe ND, 53% had moderate-severe depressed mood ( $p < 0.05$ ). We also note that 15% of patients were taking prescription analgesics that had not been prescribed by a doctor, and 50% were recent consumers of alcohol. **DISCUSSION & CONCLUSIONS:** Consistent with findings from other countries, we find statistically robust associations linking levels of nicotine dependence and levels of depressed mood, especially among women. Because depressed mood may compromise the effectiveness of smoking cessation interventions, this research reinforces a need for clinical guidelines to address comorbidity issues early in the referral and treatment-seeking process. The issues of male-female variation in the strength of this ND-DM association, and the possible importance of co-occurring prescription analgesic and alcohol use require more detailed investigation. The possibility that the female patients with high levels of depressed mood also are suffering from major depression cannot be ruled out.

**GENDER DIFFERENCES IN SLEEP AND SLEEP-DEPENDENT LEARNING IN ABSTINENT COCAINE USERS**

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**Background** Cocaine abusers experience sleep disturbances during abstinence. In primarily male samples, sleep time and efficiency and sleep-dependent learning become significantly worse over 2-3 weeks of abstinence. As progesterone affects sleep, and cocaine use can alter the menstrual cycle, we hypothesized that female cocaine abusers would differ from males during abstinence. **Method** 26 cocaine dependent men and women participated in an inpatient study. Sleep and sleep-dependent procedural learning were assessed at 3, 10 and 20 days of abstinence using the Nightcap sleep monitor, visual analog scales, and a motor sequence task. Female subjects entered the study in the menstrual/early follicular phase. 15 healthy subjects completed the same sleep and sleep dependent procedural learning assessments. **Results** Cocaine dependent males exhibited deteriorations in sleep time, sleep efficiency, and sleep-dependent learning as abstinence progressed from 3 to 20 days. Cocaine dependent women exhibited no such change, and a significant gender by days abstinent interaction was found for sleep efficiency and sleep dependent learning. Cocaine dependent men and women at 3 days abstinence and healthy subjects were similar in the main outcomes. One way ANOVA of sleep measures across the three groups of cocaine men, cocaine women (abstinence day 20) and healthy subjects yielded significant differences between cocaine men and healthy subjects in sleep time and sleep-dependent learning, and between cocaine men and cocaine women in sleep efficiency and sleep-dependent learning. There were no differences between healthy subjects and cocaine dependent women in these measures. **Conclusions** There is growing evidence that sleep disturbance associated with cocaine abuse and abstinence has functional consequences and may be relevant to the development of effective treatments. The absence of this finding in female cocaine abusers suggests possible gender based therapies. The mechanism of this gender difference should be explored in future studies. Supported by NIH grants P50DA16556;K02DA17232;K12RR1759

**ROLE OF BREAST CANCER RESISTANT PROTEIN ON TRANSPLACENTAL TRANSFER OF METHADONE**

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The function of placental efflux transporters P-glycoprotein and BCRP is to protect the fetus from xenobiotics, environmental toxins and administered therapeutics/drugs. This function is achieved by extrusion of these compounds from the syncytiotrophoblast layer back to the maternal circulation thus decreasing its concentration in the fetal circulation. Methadone is the therapeutic agent of choice for treatment of the pregnant opiate addict and its transfer across human placenta is affected by the activity of P-glycoprotein. The aim of this investigation was to determine the role of BCRP on placental transfer of methadone. Data obtained utilizing BCRP expressed mammalian membranes indicated that methadone binds to BCRP as revealed by activation of ATPase activity. The activity of placental BCRP in the efflux of methadone was determined utilizing the technique of dual perfusion of

placental lobule. The transfer of mitoxantrone (4 µg/ml), the prototypic substrate of BCRP, in presence and absence of the inhibitor that is selective for the efflux transporter (Ko143, 100nM) was determined. The effect of Ko143 on the extent of mitoxantrone transfer across human placenta served as a positive control. The transfer of methadone (200 ng/ml) was determined under the same experimental conditions. The marker compound antipyrine was co-transfused with mitoxantrone and methadone to account for interplacental variations. Fetal transfer rate and the clearance of mitoxantrone in presence of Ko143 were higher than in its absence as revealed by their increase from  $5.6 \pm 1.6$  to  $7.9 \pm 1.9$  % and  $0.14 \pm 0.04$  to  $0.21 \pm 0.05$  (ml/min), respectively ( $p < 0.05$ ). On the other hand, the transfer rate and clearance of methadone were not affected by the presence of BCRP inhibitor Ko143. These data indicate that placental BCRP will not affect the extent of methadone transfer to the fetal circulation. Supported by a grant to MSA (DA-13431 from NIDA).

#### **SEXUAL-RISK BEHAVIOR AMONG FEMALE CRACK USERS IN SÃO PAULO, BRAZIL**

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Nowadays, in Brazil, there is a growing number of new recorded cases of HIV infection among women, mainly transmitted by sexual intercourse. This increase may be associated to the development of sexual risk behavior among female crack users who, according to informal reports, have exchanged sex for drug or money for its possession. Aim: As epidemiologic studies have not yet pointed out the existence of this phenomenon, in the city of Sao Paulo, the aim of the present study was to investigate it, in depth, through a qualitative ethnographic approach. Methods: An intentional sample was adopted, composed of 75 female crack users, in the city of Sao Paulo, who were selected by criteria, through key informants participation and snowball sampling methods. Participants were submitted to a semi-structured and in-depth interview. Verbatim data were reinforced and extended by fieldwork observation. Results: Female crack users aged 14 to 45 years-old, had lower education level and no formal jobs, usually exchanging sex for crack or money for it. They engage up to 9 sexual intercourses daily with different sexual partners. They approach their sexual partners in an aggressive manner, adopting groundless criteria for this selection. Sex exchange conditions as sexual intercourse price and condom use are leaved up to the "client" decision, since female crack users are usually craved. Aside, considering that they usually used inadequate pipes to smoke crack, it is common for them to have blisters or lesions on their lips. Since oral sex is the fastest sexual modality, it is the preferable among female crack users. Conclusion: The relationship between crack and the sexual risk behavior engaged by female crack users became them especial targets concerning STD/HIV transmission, besides putting them under a considerable social stigmatization that has become a social intervention even harder, especially when considered that the public health concern is not restricted to the female crack users and their sexual partners but also to the undesired pregnancies and births.

#### **PATTERNS OF HIV TESTING AMONG DRUG USERS IN ST. PETERSBURG, RUSSIA**

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Background. Since 1996, Russia has experienced one of the fastest growing HIV epidemics in the world. The prevalence of HIV among injection drug users (IDU) exceeds 30% in many cities, and HIV incidence among IDU in St. Petersburg is 4.5 per 100 person-years. Little is known about patterns of HIV testing in St. Petersburg. Methods. As part of a NIDA funded study, 350 IDU were recruited from November 2005 - September 2006 using chain referral techniques. Data collection included audio-computer assisted survey interviewing and biological testing for HIV infection. Testing for recent infection was performed using the BED HIV-1 Capture Assay. Descriptive statistics and chi-square tests were employed to describe patterns of HIV testing among drug users. Results. Among IDU, 24% had never been tested for HIV. Among those who had been tested, 30% had only been tested once, 28% had not been tested in the past 12 months, and 15% had not received their test result (of whom 57% were HIV-positive compared to 48% in the entire sample). Men were less likely to have been tested than women (14% vs. 25%,  $p=0.05$ ), and younger drug users (age  $< 26$  years) were less likely to have received test results (8% vs. 19%,  $p=0.01$ ). Among those with recent HIV infection as determined by BED assay ( $n=26$ ), 12 (46%) had not been previously tested. Among the 14 who had been tested, 3 (21%) had not received test results. Conclusions. Despite widespread availability of testing, many IDU in St. Petersburg had not tested for HIV. A higher number of individuals than expected who were tested but did not return for test results were HIV-positive. Many individuals who had not been tested were recently infected. Efforts are needed to increase frequency of testing to identify recently infected individuals, and to increase return rates for test results. In this setting of high HIV incidence, frequent testing to identify individuals with early infections and high viral loads will be important to interrupt the chain of transmission.

## **SUBSTANCE USE AMONG TRANSGENDER WOMEN IN NEW YORK CITY**

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Male-to-female transgender persons (transgender women) are often assumed to be at a high risk for substance use. To better assess substance use in this unique population, we employed a 12-panel urine assay of recent substance use (manufactured by Instant Technologies) in conjunction with a community-based sample of 157 participants currently enrolled in an on-going longitudinal study of transgender women in the New York Metropolitan Area (The New York Transgender Project). All participants were medically assigned as “male” at birth, but now define themselves as completely “female” or at least partially “female” in certain situations or roles. They were 19 to 71 years of age (mean of 41) and diverse with regard to ethnicity. Overall Hispanic identification was 30%, with 17% and 63%, respectively, identified as African American or white (Hispanic or non-Hispanic). Sixty six percent reported a lifetime history of hormone replacement therapy to enhance femininity. Somewhat surprisingly, sixty two percent were found to be negative for all twelve assayed drugs. Completely negative results for recent substance use was associated with age ( $r=.40$ ). Among the 38% ( $n=60$ ) with a positive drug assay, 63% were positive for THC; 48% were positive for cocaine; 17% were positive for benzodiazepines (some of which may have been medically prescribed); and 7% were positive for methadone (which may reflect enrollment in a methadone maintenance program). Other drugs (including opiates, amphetamines, methamphetamine, barbituates and PCP) were reported by less than 5%. These data indicate that substance use is, indeed, a serious problem in a subset of this population, defined in part by younger age. But these data also indicate that most transgender women are not currently taking illicit drugs. Support by grant 1 R01 DA917979-01A0 from NIDA

## **ENHANCING IDENTIFICATION OF CHILD MALTREATMENT RISK WITH INDIRECT SUBSTANCE ABUSE ITEMS**

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Children who experience maltreatment are at increased risk for development of drug and alcohol use disorders. Identification of potentially abusive/neglectful parents therefore has implications for prevention. The Brief Child Abuse Potential Inventory (BCAP) is an indirect measure of child maltreatment risk with very good reliability and validity; however, it presently does not take advantage of the substantial association between substance use disorders and child maltreatment. We therefore examined a range of items associated with substance abuse as possible supplements to the BCAP. Using a case-control design, we examined the ability of supplemental items to (a) predict group classification, and (b) predict group classification above and beyond the current BCAP. Participants were 100 low-income, urban women being seen at a clinic serving parents involved with child welfare services, and 100 women of similar SES seeking medical care for their children. All participants completed the BCAP as well as investigational items, which were direct (e.g., 'Have you ever used an illicit drug?') as well as indirect (e.g., 'Have you been injured in an assault or fight?'). A subset of six supplemental items predicted group classification as accurately as did the BCAP (ROC curve = .74 for BCAP and .77 for supplemental items), and predicted group classification above and beyond the BCAP,  $c2(1, N = 200) = 23.2, p < .001$ ). Interestingly, the most promising supplemental items were indirect rather than direct. Although cross-validation of the six supplemental items utilized in this analysis is necessary, our findings suggest that these items may enhance the ability of the BCAP to identify at-risk parents. Enhanced identification of at-risk parents can facilitate parent-focused interventions with the potential to decrease children's risk for later development of drug and alcohol use disorders.

## **GENDER DIFFERENCES IN PROVIDER'S SCREENING FOR PERINATAL SUBSTANCE USE**

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Background: Perinatal substance use contributes to a myriad of birth defects, prematurity, and infant mortality in the U.S. As such, it is critical that medical professionals receive appropriate education and actively engage in screening patients. However, screening practices surrounding perinatal substance use may differ across male and female medical providers. The purpose of this study is to examine male and female medical provider's knowledge and practices related to perinatal substance use. Methods: Data was collected from 131 Ob/Gyn's in Kentucky using a web-based survey. Chi-square and t-tests were used to distinguish differences between male ( $n=84$ ) and female ( $n=47$ ) providers, while binary logistic regression was used to assess the independent correlates of the use of the CAGE. Results: Female Ob/Gyn's were significantly younger and more likely to report having received the majority of their substance use information from medical school. Female Ob/Gyn's were also more likely to discuss stress, mental health concerns, and sexual abuse with pregnant women than their male counterparts. While there were no significant gender differences in the advice given to pregnant women regarding substance use, type of screening, or the frequency of screening, female providers were more likely to be familiar with the CAGE

questionnaire and to use the CAGE. Results from the binary logistic regression indicated that being younger, not practicing in a private practice, learning about substance abuse during medical training, learning about substance abuse from professional journals, and discussing mental health issues with female patients of childbearing age significantly increased the odds of using the CAGE. Conclusions: While there were few gender differences in Ob/Gyn's knowledge and screening practices surrounding perinatal substance abuse, addition training is needed to foster the use of substance abuse screening for all women to improve the quality of care.

#### **CORRELATES OF INJECTION DRUG USE AMONG FEMALE SEX WORKERS IN TWO MEXICAN-U.S. BORDER CITIES**

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Female sex workers (FSWs) aged  $\geq 18$  years in Tijuana and Ciudad Juárez underwent baseline interviews and antibody testing for HIV, syphilis, and LCR testing for gonorrhea and Chlamydia. Logistic regression was used to identify factors associated with injecting drugs within the last month. Of 920 FSWs, 21% in Tijuana and 14% in Cd. Juarez had ever injected drugs; 16% and 9% had injected in the past month. Among FSW-IDUs (N=112), prevalence of HIV, active syphilis, gonorrhea and Chlamydia was 14%, 25%, 15% and 22% compared to 4%, 12%, 4% and 11% among other FSWs (N=803), respectively. Compared to other FSWs, FSW-IDUs were significantly younger and more likely to speak English, to be married (including by common law), to have an IDU sex partner, and to have worked longer in the sex trade. FSW-IDUs had more clients in the past 2 months (median: 423 vs. 324,  $p=0.02$ ) and received less money for sex. FSW-IDUs were less likely to use alcohol before sex, but were more likely to frequently use drugs before sex (47% vs. 9%,  $p<0.001$ ) and to report having clients from the U.S. Factors independently associated with injecting drugs in the past month included being younger (AdjOR: 0.92 per yr), having a steady partner (AdjOR: 2.1), working in the sex trade  $\geq 2$  years (AdjOR: 2.0), speaking English (AdjOR: 2.7), being a street worker (AdjOR: 3.6), earning  $< \$40$  U.S. for sex without condoms (AdjOR: 2.0), often using drugs before sex in the last month (AdjOR: 6.6), and knowing other FSWs who injected drugs (AdjOR: 2.5). These analyses support that in these border cities, FSW-IDUs engage in riskier behaviors, are more vulnerable to having unsafe sex with clients, and require specific interventions to target both their injection and sexual risks.

#### **INCREASED NICOTINE SELF-ADMINISTRATION AFTER PRENATAL EXPOSURE TO NICOTINE IN THE RAT**

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Although the mechanisms that drive the progression of cigarette smoking from experimentation to dependence remain unknown, epidemiologic data indicate that individuals exposed to tobacco smoke in utero are more likely to abuse nicotine as adults. The goal of the present study was to characterize the effect of prenatal exposure to nicotine on nicotine self-administration in the adult rat. Rats were bred in-house and on day 4 of pregnancy the mothers were implanted with osmotic mini-pumps containing vehicle or nicotine bitartrate (6.0 mg/kg/day). Beginning on postnatal day 100, one male and one female offspring from each of the litters underwent food training, followed by daily, 60 min nicotine self-administration sessions under a fixed ratio 5 schedule of reinforcement. The rats were given access to nicotine for 14 days (acquisition phase), saline for 7 days (extinction phase), then nicotine for another 7 days (reinitiation). Prenatal exposure to nicotine produced statistically significant increases in the number of infusions during the acquisition phase in male, but not female rats. Alpha4beta2 nicotinic cholinergic receptors labeled by [3H]-cytisine are thought to be involved in the reinforcing properties of nicotine. Additional rats from the same litters were sacrificed on postnatal day 120, and [3H]-cytisine saturation binding studies were conducted using individual cortical and striatal membranes. There were no statistically significant differences in Bmax between the prenatal vehicle- and nicotine-treated groups. DNA microarray technology was used to characterize gene expression in cortical tissue from other littermates. We found that a number of genes for GABA A and B receptor subunits were down-regulated in the prenatally nicotine-exposed male rats. Because GABAergic systems have been implicated in nicotine addiction, the increase in nicotine self-administration in adult male rats might be linked to the decreases in GABAergic neurotransmission as a consequence of prenatal exposure to nicotine.



## **GENDER DIFFERENCES IN HIV RISK BEHAVIOR, TRAUMATIC EVENT EXPOSURE, AND PTSD IN SYRINGE EXCHANGE ENROLLEES**

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Male and female syringe exchange enrollees engage in both drug- and sex-related HIV risk behaviors. As previously reported (Peirce et al., 2006), enrollees also have extensive histories of traumatic event exposure and posttraumatic stress disorder (PTSD). The present study was designed to explore the interrelationships between gender differences in HIV risk behaviors and trauma/PTSD in a group of 162 syringe exchange enrollees. Participants completed the Risk Assessment Battery (RAB), the Traumatic Life Events Questionnaire, and the Modified PTSD Symptom Scale. Of the 162 participants, 30% were women. The average age was 40 years, and 73% had minority status. Although 59% had a high school education, only 17% were employed in any capacity. Nine percent of participants reported HIV+ status. Consistent with research showing that women injecting drug users are more severely impaired by their substance use disorder than men, women enrollees had higher drug risk severity scores ( $p < .02$ ) and higher needle and sex risk severity scores ( $p < .001$ ) on the RAB than men. Women were more likely than men to report engaging in sex for drug exchanges (42% vs. 20%;  $p < .005$ ) and sex for money exchanges (38% vs. 14%;  $p < .001$ ). As before, women reported more traumatic events than men (29 events vs. 21 events;  $p < .02$ ) and were more likely to meet criteria for PTSD than men (46% vs. 18%;  $p < .0001$ ). The total number of traumatic events was not highly correlated with RAB scores ( $r_s < .3$ ). Participants meeting criteria for PTSD had higher drug risk severity scores on the RAB than those without PTSD ( $p < .05$ ), but there was no interaction with gender. In contrast, women meeting criteria for PTSD had higher needle and sex risk severity scores on the RAB than women without PTSD or men with or without PTSD ( $p=.05$ ). These findings highlight the importance of PTSD as an influence on HIV risk behavior in women injecting drug users. Research supported by NIH NIDA K23015739.

## **EPIDEMIOLOGY OF ALCOHOL AND DRUG USE IN SOUTH AFRICA: A REVIEW**

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**Background:** Given that middle income countries such as South Africa are at increasing risk for drug use and abuse, the need for hard data to accurately monitor drug abuse in South Africa is needed. This review synthesizes available epidemiological data on current drug use in South Africa, particularly among women and young people. **Methods:** Several databases were systematically searched for articles published in peer-reviewed journals at any time during the last century to end-2006. Data from several large epidemiology data sets were analyzed. The search resulted in the retrieval of 254 articles in which the current use of drugs in South Africa was reported. **Results:** Comparisons revealed that the prevalence, and intensity (frequency and/or quantity) of most drugs (tobacco, alcohol, cannabis and other illicit drugs) used was higher among males, lower educated, and living in urban areas compared to females, higher educated, and living in rural areas. Certain racially classified social groups in South Africa were at increased risk for drug use. Tobacco use significantly decreased over the past 10 years to 31.2% among men and 8.4% among women in 2003. Alcohol use and risky drinking remained stable for adults (e.g. past month binge drinking among men 14.3% and women 3.2% in 2005); risky drinking increased for the youth over the past 10 years. Female current drinkers were proportionally higher risky drinkers than current drinking men. There was a significant increase in current alcohol use among pregnant women from 7% in 1998 to 12.6% in 2005. The most used illicit drugs include cannabis, inhalants, mandrax, club drugs (ecstasy, methamphetamine). Cocaine and opiates appear to be on the increase. The onset of alcohol and illicit drug use seems to have decreased into the younger age groups. **Conclusions:** While the prevalence of drug use in South Africa is relatively low compared to USA and Australia and some other developing countries, prevention and intervention policies should be designed to reduce these levels by targeting the more risky subpopulations identified from this review.

## **INCENTIVE SALIENCE OF COCAINE IS REMARKABLY SIMILAR ACROSS THE POSTPARTUM PERIOD**

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In previous studies using conditioned place preference (CPP), that offered a choice between cues associated with pups versus cues associated with cocaine, early postpartum dams (PPD8) most frequently choose cues associated with pups, while late postpartum dams (PPD16) choose those associated with cocaine. This relative-reinforcing paradigm suggests that the dam's endocrinological and physiological substrates may alter the reinforcing values of pups and/or cocaine. The present experiment examines the reinforcing properties of cocaine (5.0, 10.0 and 20.0 mg/kg), in the absence of competition from pup-associated cues. Using a three chambered CPP apparatus early (n5.0mg/kg=12, n10.0mg/kg=23, n20.0mg/kg=12) and late (n5.0mg/kg=12, n10.0mg/kg=22, n20.0mg/kg=10)

postpartum dams received 30 min conditioning trials with IP cocaine or saline each day for four consecutive days (PPD 4-7 and PPD 12-16, respectively). Dams were tested while in a drug-free state the day after conditioning concluded. Both PPD8 and PPD16 dams exhibited approximately equal cocaine-associated chamber preferences after conditioning with 5.0 and 10.0 mg/kg IP cocaine (PPD85.0mg/kg: 83% and PPD165.0mg/kg: 83%; PPD810.0mg/kg: 52%, and PPD1610.0mg/kg: 59%). However, after conditioning with 20.0 mg/kg cocaine, the fewer dams preferred the cocaine-associated chamber, a population not statistically different from the number of dams with preference for either of the other preference categories (PPD820.0mg/kg: 41.7% and PPD1620.0mg/kg: 50%). The dose-preference pattern of reinforcing properties of cocaine alone is remarkably similar across these two postpartum time points, suggesting that the changing hormonal status of the dam does not importantly impact the salience of cocaine as a incentive stimulus. This also suggests that the preference differences between the early and late postpartum dams when given a choice between pup- and cocaine-associated cues are primarily driven by maternal motivation for the pup.

#### **DRINKING CONTEXTS, GENDER, AND CULTURE IN PERU**

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The aim is to compare drinking contexts for males and females in two cities of Peru (one in the Andean region and other in the coast). Understanding the different drinking situations such as place, time and relationship with the person with whom one drinks is necessary to tailor alcohol control and prevention policies. Methods: The GENACIS (Multinational OMS Gender, Alcohol and Culture Study estimates gender differences for drinking patterns in a household sample of 18 to 64 years of age Peruvian residents of the cities of the capital of Peru, Lima (n= 1,110), and Ayacucho (n= 421). The study analysed data from face to face interviews conducted during a multiple stage probability sample interviewed in 2005. Results: In Peru the most important drinking context is the party. Drinking at a friend's house, street or plaza is more frequent for males than females. Drinking at work is more frequent for males in Ayacucho, probably related with agricultural activities. Drinking at home or restaurant is more frequent in Lima than in Ayacucho. In Lima, most of the drinking occurs weekends afternoons and nights. Drinking on weekdays is a more extended practice in Ayacucho than in Lima. For example 20.4% of males in Ayacucho and 8.5% in Lima report drinking 11 and 36 times before 5pm during the last year. About 17.1% of females in Ayacucho and 5.5% in Lima report this practice. Drinking weekends before 5 pm is also more extended in Ayacucho than in Lima. Men drank more alone, with friends and other family members. Women drank more frequently with their spouses. Conclusion: The present study shed light for gender and culturally appropriate policy and prevention interventions. A number of alcohol policy regulations related with places and hours of alcohol beverages expenditure can be developed and adjusted. In the same way preventive messages and interventions need to adapt to cultural variation in the Andean region.

#### **GENDER DIFFERENCES IN TOBACCO DEPENDENCE MEASURES AND WITHDRAWAL**

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Data from 2 randomized placebo-controlled smoking cessation trials (N = 970) were used to examine gender differences in tobacco dependence. All participants completed a baseline questionnaire assessing smoking patterns and demographic data, as well as the Wisconsin Inventory of Smoking Dependence Motives (WISDM), the Fagerström Test of Nicotine Dependence (FTND), the Nicotine Dependence Symptom Scale (NDSS) and the Tobacco Dependence Screener (TDS). Analyses revealed that women scored significantly higher on the following scales: WISDM Affiliative Attachment, WISDM Cue Exposure/ Associative Processes, WISDM Negative Reinforcement, WISDM Weight Control, WISDM Total, TDS Total, NDSS Drive, NDSS Priority, whereas men scored significantly higher on the FTND, NDSS Continuity and number of cigarettes smoked per day. In one study (N = 608), participants also provided ecological momentary assessment (EMA) data on their withdrawal symptoms and affect for one week pre-quit and post-quit. Using the EMA data collected one week pre-quit and one week post-quit, we examined growth patterns for withdrawal variables (e.g., total withdrawal, negative affect, craving) with maximum likelihood estimation. Analyses of withdrawal patterns revealed that on the quit day, women had significantly larger increases in total withdrawal ( $t = -1.94, p = .05$ ) and craving ( $t = -2.34, p = .02$ ), a significantly larger decrease in positive affect ( $t = 3.37, p = .001$ ) and a trend toward a significantly larger increase in negative affect ( $t = -1.76, p = .08$ ) than did men. Women also had significantly lower pre-quit rates of craving than did men ( $t = 2.85, p = .01$ ). These results suggest that women and men have different manifestations of dependence as indexed by both paper and pencil assessments and in vivo assessment of withdrawal experiences. Results suggest different manifestations of dependence motivational processes in men and women.

### **MALE-FEMALE DIFFERENCES IN ALCOHOL-RELATED ATTITUDES: DATA FROM PURPOSEIVE SAMPLE SURVEYS OF ADULTS IN SLOVENIA: 2001-2005**

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Background: In many countries, with respect to the use of alcohol, tobacco, and many other drugs, traditional male-female differences are in flux, and there are concurrent changes in attitudes about alcohol policies and behaviors. In this research, conducted in Slovenia with purposive sample surveys, we sought to estimate male-female differences in selected attitudes toward drinking. Methods: Each year from 2001-2005, the Slovenian "WIN OR LOSE - YOU CAN CHOOSE" Foundation conducted survey of young people on site at shopping malls, night-clubs, and sporting events. Summed across these years, purposive sampling at these venues yielded a total of 34,643 adult participants (45% male; mean age=25 years), each of whom consented to answer 6 attitude questions and 4 demographic items. Attitudes were assessed via items about the appropriate age to (a) drink alcohol for the first time, (b) to get drunk for the first time, and (c) to drink regularly, and about appropriate quantities to drink (a) during the weekend, (b) going on dates; and (c) going to school or work. The generalized linear model with logistic link and generalized estimating equations (GLM/GEE) were used to estimate male-female differences, with robust estimation of standard errors and statistical control for interdependent covariates. Results: Despite a background of secular trends in drinking, males held more favorable and liberal attitudes toward drinking as compared to females. Example: with respect to a summary conservative attitude scale, males showed more liberal values (estimated odds ratio 0.85;  $p < 0.001$ ); the same was true for individual items (all  $p < 0.001$ ), even with covariates held constant (age, occupational status, year of survey). Conclusions: These purposive survey estimates are being used to guide the Foundation's plans for internet and other mediated information campaigns, with due attention to recent evidence of boomerang effects in these campaigns (i.e., media messages yielding results opposite of those intended).

### **LATINAS IN PRIMARY RELATIONSHIPS: ACCULTURATION, RELATIONSHIP POWER, SUBSTANCE USE AND SEXUAL RISK BEHAVIORS**

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Latinas are disproportionately represented among U.S. AIDS incidence cases. To increase our understanding of risk behaviors among Latinas 18-29 years old, we compared acculturation, relationship power, substance use, and unprotected sex among Puerto Rican and Mexican Latinas. Hypothesis. We hypothesized that greater acculturation and less relationship power would be associated with unprotected sex. Procedures. The survey to access acculturation (ethnic identity, ethnic interaction, language use), relationship power, and risk behaviors was administered to a convenience sample of low income Latinas (N=40) in 2004. Analyses. Descriptive and multivariate analyses were conducted to examine the variables of interest. Results. Overall, 93% (n=37) engaged in at least 1 sexual risk behavior with a primary partner in the past three months. 90% (n=36) reported unprotected vaginal sex, and 10% (n=4) reported unprotected anal sex. 35% (n=14) used alcohol and 13% (n=5) used non-injected drugs (e.g., marijuana, cocaine, ecstasy) before/during unprotected sex. 23% (n=9) had unprotected sex with a partner who engaged in extradyadic sex. 2% (n=1) had unprotected sex with a partner who used injected drugs. No respondent reported that her partner had sex with men or was HIV positive. No demographic variables were significant, and were not retained in the final model. All the theoretical variables were retained in the final model [ $F = 3.13$  ( $df=4, 35$ );  $Adj R^2 = .18$ ,  $p < .03$ ] whether or not they were significant. Greater ethnic identity ( $t=2.05$ ,  $p < .05$ ) and less relationship power ( $t=-2.23$ ,  $p < .04$ ) were associated with greater unprotected sex with primary partners. We did not find a significant effect for language use or ethnic interaction, which may be an artifact of a small sample size. Implications. Educational and prevention programs that focus on relationship power among young U.S. Latinas are likely to be effective at reducing sexual risk behavior.

### **TO WHAT EXTENT DOES GENDER IDENTITY, PEER RELATIONSHIPS, AND PARENTAL RELATIONSHIPS PLAY A ROLE IN ADOLESCENT FEMALE SUBSTANCE USE?**

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Before 1985, rates of substance use by adolescent females and adolescent males differed significantly, leading researchers to conclude that girls were somewhat protected from substance abuse (Substance Abuse and Mental Health Services Administration [SAMHSA], 1997). Rates of substance use started to merge in the mid-1980s; currently certain substance use rates are greater for females. The past four decades produced an increase in the rate of initial use for alcohol and other drugs among females 10 through 14 years of age (SAMHSA, 2005). According to the National Survey of Drug Use and Health, 1.5 million females 12 to 17 years of age started drinking in 2004, compared to 1.28 million males, and 14% of females 12 to 17 misused prescription drugs, compared to the rate of 12.5% for males. National survey results from the Monitoring the Future Study showed a higher rate of tranquilizer and inhalant use for eighth-grade females and a higher rate of amphetamines use for both eighth- and tenth-grade

females compared to adolescent males (Johnston, O'Malley, Bachman & Schulenberg, 2005). The change in substance use by adolescent females is baffling (Guthrie & Flinchbaugh, 2001; Pizer, 1999; Tarasevich, 2001). An increase in the rate of initial use for alcohol and other drugs among females 10 through 14 years of age is particularly disturbing (SAMHSA, 2005); substance abuse dependency at later ages correlates with experimentation at younger ages (Dick, Rose, Viken, & Kaprio, 2000). There is an association between gender identity and the substance use of adolescent females (Horowitz & White, 1987; Husefield & Cooper, 1992; Kulis, Marsiglia, & Hurdle, 2003). Peer relationships have also been linked to adolescent female substance use (Pearson & Mitchell, 2000; Oetting & Donnermeyer, 1998). Parents also influence adolescent substance use, particularly adolescent females (Crosnoe, Erickson, & Dornbush, 2002; Webb, Bray, Getz, & Adams, 2002). The literature review examines adolescent female substance use and gender identity, peer relationships, and family relationships.

#### **RELATIONSHIP BETWEEN PARENT AND CHILD RISK TAKING PROPENSITY AS INDEXED BY THE BALLOON ANALOGUE RISK-TASK**

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When examining the relationship between child and parent risk taking, previous research has rarely been able to adequately assess risk-taking among parents. This previous research has been plagued by response biases among parents, particularly strategic answering to appear less risky. With the development of behavioral measures of risk-taking, less transparent strategies for assessing the link between parent and child risk behavior may be possible. Indeed, behavioral measures address the previously mentioned shortcomings of self-report measures as contingencies that inspire actual "riskiness" are produced in a controlled environment. The current study examines the relationship between parent (both mother and father) and child risk taking behavior as indexed by BART score (Balloon Analogue Risk Task (BART; Lejuez et al., 2002). The BART is a computerized, laboratory-based measure of risk taking. Previous research in our lab has found that in both children and adults, the level of riskiness on the BART is correlated with real-world unsafe sexual practices, illicit drug use, alcohol use, smoking, gambling, stealing, and seat belt non-use. The current sample includes 240 children and their mothers and fathers. Our results indicate that parent BART score is correlated with child BART score ( $r = .37$  for father,  $r = .28$  for mother). Further, there is a moderating effect of gender whereby father BART score is more highly correlated with male child score ( $r = .45$ ) than with female BART score ( $r = .22$ ), and mother BART score is more highly correlated with female child BART score ( $r = .48$ ) than with male child BART score ( $r = .15$ ). Additionally, similar but less clear results were found with self-report measures of sensation seeking and impulsivity, which also will be explored. This study adds to the current dearth of literature on the differential role mothers and fathers play in child risk taking behavior.

#### **ABNORMAL BRAIN MYELINATION OCCURS FOLLOWING PERINATAL OPIOID EXPOSURE IN THE RAT**

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Methadone and buprenorphine have been used in the management of pregnant opioid addicts. In utero opioid exposure has been associated with behavioral and neurological defects in children. The mechanisms responsible for these effects are poorly understood but it is logical to hypothesize that these drugs acting on opioid receptors may affect crucial steps along nervous system development. Immature oligodendrocytes express mu and delta opioid receptors whereas mature oligodendrocytes express greater numbers of kappa opioid receptors. In the present study we have investigated the possible effect of perinatal opioid exposure to these drugs on brain myelination. For this, rat pups were pre- and postnatally exposed beginning on gestational day 7, via maternally implanted osmotic minipumps, to water (controls) or methadone (9 mg/kg/day) or different concentrations of buprenorphine (0.3 and 1 mg/kg/day). Analysis at different postnatal ages of the myelin basic protein splicing isoforms and the pattern of glycosylation of the myelin associated glycoprotein (MAG) as well as electron micrographic analysis of neuronal myelination indicate that perinatal opioid treatment significantly alters the myelination process. These results show for the first time that opioid signaling plays an important role in regulating myelination in vivo and underscore the importance of further studies investigating the link between neurological problems and opioid-related mechanisms in the children from addict mothers. (Supported in part by A.D. Williams Trust, National Multiple Sclerosis Society and National Institute on Drug Abuse grants).

#### **CORRESPONDENCE BETWEEN CHANGES IN CIGARETTE SMOKING AND CAFFEINE USE AMONG PREGNANT WOMEN**

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Many pregnant women are faced with the challenge of changing their use of cigarettes and caffeine as use of either substance can adversely affect the health of the fetus. The purpose of the present study was to examine correspondence between changes in self-reported cigarette and caffeine use from pre-pregnancy to 1st prenatal

visit. Subjects were 167 pregnant women enrolled in studies on treatments for cigarette smoking. Cigarette use, caffeine use, and demographic information for each subject were collected at study enrollment, which was usually at the time of first prenatal visit. For each substance, women reported whether they 1) quit, 2) decreased, or 3) maintained the same amount of use of each substance from pre-pregnancy to the 1st prenatal visit. Mean age of study participants was 24.78 years, mean education was 12.63 years, and 94% of the sample was Caucasian. There was a significant correspondence between use of the two substances ( $\chi^2 = 32.25$ ;  $p < .01$ ). 34%, 56%, and 10% of women reported quitting, decreasing, or maintaining cigarette use, respectively, from pre-pregnancy to 1st prenatal visit, and 25%, 62%, and 13% reported quitting, decreasing, or maintaining caffeine use. The group of women who quit cigarette use had the highest proportion of women who quit caffeine use (49%), the group of women who decreased cigarette use had the highest proportion of women who decreased caffeine use (75%), and the group of women who maintained cigarette use had the highest proportion of women who maintained caffeine use (31%). When the three categories of cigarette use were examined within the categories of caffeine use, the same pattern of results was observed. These results show that women tend to change the use of cigarettes and caffeine similarly during pregnancy. Given that nicotine and caffeine are pharmacologically different from each other, the similar patterns of use seen among the women underscores the role of non-pharmacological factors as important determinants of use of the two substances during pregnancy.

#### **DISSOCIATION BETWEEN PHYSIOLOGICAL AND MOTIVATIONAL EFFECTS OF ALCOHOL IN FEMALE FISCHER & LEWIS RATS**

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The inbred Fischer & Lewis rat strains have been used to model genetic factors in drug abuse; however, the effects of genotype on responses to drugs such as alcohol may also be sex-dependent. Roma et al. (2006) reported that male Fischer rats were more sensitive to alcohol's aversive effects as assessed by conditioned taste aversion (CTA), despite a lack of hypothermic effects or strain differences in blood alcohol levels at the doses tested. The purpose of the present study was to assess the physiological and motivational effects of alcohol in female Fischer & Lewis rats. To this end, female Fischer & Lewis rats underwent a 4-trial CTA procedure in which 20-min saccharin consumption was followed by injection of 1 or 1.5 g/kg IP ethanol (15%,  $n = 10-12$ /strain/dose). Additional females were injected with saline or 1.5 g/kg IP ethanol ( $n = 7-8$ /strain/dose), with tail-blood samples and core body temperature readings taken at 15-, 60- and 180-min post-injection. Dose-dependent CTAs were produced in both strains, with consumption ultimately reduced by 30% at 1 g/kg and by 90% at 1.5 g/kg; however, there was no Trial x Strain x Dose interaction ( $F(3,123) = 0.1$ ,  $p > .90$ ), indicating equivalent alcohol-induced CTAs in both strains at each dose. Although hypothermic responses did not differ between the strains at any point (Time x Strain x Dose  $F(3,78) = 0.65$ ,  $p > .50$ ), blood alcohol levels were significantly higher in the Lewis animals at all three time points (Time x Strain x Dose  $F(2,52) = 3.4$ ,  $p < .05$ ). These data further support a dissociation between alcohol absorption, hypothermia and CTA in Fischer & Lewis rats, and when considered together with the male data, imply a centrally-mediated Genotype x Sex interaction effect on the aversive motivational properties of alcohol.

#### **SOCIAL SUPPORT NETWORKS FOR MOTHERS WITH PROBLEM DRINKING**

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Background: Mothers struggling with alcohol problems face a unique set of stressors. This paper looks at the support networks of 118 mothers who engaged in problem drinking and who had adolescent children. Methods: As part of a larger study called Family First, we assessed the quantity and quality of social support in the domains of emotional and material support, parenting stressors, and drug and alcohol problems. Average age of participants was 40.93 years ( $SD = 6.13$ ). Most were from racial/ethnic minority and low SES backgrounds. Results: Support networks tended to be small; most ( $n=105$ ; 93.8%) included only 2 people, and only 1 included 9 or 10 people (10 being the maximum). For the first person listed, 67% were female ( $n=75$ ); 56.2% ( $n=63$ ) were Black; mean age was 43.56 ( $SD = 15.19$ ); 34.8% ( $n=39$ ) of these supports drank alcohol themselves and 8% were said to have alcohol problems. The relationship to the respondents was most frequently friend, romantic partner, mother, or the respondent's child. Support received was high for emotional support (86.6%), but more moderate (42.9%) for material, (39.3%) parenting, and (39.3%) support for drug/alcohol concerns. For the second support 74.3% were female ( $n=78$ ); mean age was 42.54 ( $SD 14.74$ ); 60.7% ( $n=68$ ) were Black. Half (53.8%,  $n=57$ ) reported receiving emotional support, while 32.1% ( $n=34$ ) received material support; 38.7% ( $n=41$ ) received parenting support and, only 26.4% ( $n=28$ ) received support for their alcohol/drug use. The relationship of this support was (in descending order) friend, sibling, doctor or social worker, and romantic partner. Conclusions: For these women, emotional

support is strong, especially from their top listed supporter, but they have a harder time accessing support for parenting and drug and alcohol use. Their support networks typically do not include people who are problem drinkers themselves. Support systems are excellent places to help improve lives whether it means strengthening systems already in place or broadening them to help people find support they seek.

#### **GENDER DIFFERENCES IN METHAMPHETAMINE USE IN YOUTH AND YOUNG ADULTS TREATED FOR SUBSTANCE DEPENDENCE**

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Rates of past year methamphetamine (MA) use are highest among 12 to 25 year olds (SAMHSA, 2005) and MA use in the youth population remains a significant health concern. Preclinical data have demonstrated that female rats acquire the use of MA at a faster rate than male rats, and after acquisition female rats maintain higher levels of MA consumption (Roth & Carroll, 2004). Among humans, adult women have been shown to experience greater health consequences following MA abuse and dependence than men (Brecht, et al., 2004). Very little is known about the acquisition of MA use and recovery from dependence among female youth compared to male peers. Patients (N = 698) in a residential treatment program for substance dependence were assessed at baseline and followed at 1, 6, and 12 months post-discharge. The sample was 18.77 (SD = 2.03) years of age, on average, and the majority were male (68%), Caucasian (93%), and had not completed high school (54%). Among the sample, 18.5% and 2.4% met criteria for MA dependence and abuse at admission, respectively, with 13.5% (n = 94; 42% female) identifying MA as their primary drug of choice. No sex difference was found for MA abuse or dependence status. Males and females identifying MA as a primary drug of choice did not differ by age (M = 18.68, SD = 1.87) or length of stay in treatment (M = 24.65 days, SD = 6.43). By one-month follow-up, 2% of the entire sample had relapsed to MA use with 66.33 percent days abstinent from MA reported among users. No difference was noted between males and females in terms of days abstinent from MA,  $p > .05$ . Of those listing MA as their primary drug of choice, 10.67% (n = 8, 50% female) relapsed to use by one-month. Data such as these suggest equivalent rates of abuse, dependence, and recovery from MA use occur among young males and females seeking treatment. Further study is necessary to determine if preclinical sex differences for MA acquisition and recovery can be generalized to young people.

#### **SYNTHESIS AND TESTING OF NEUROACTIVE STEROIDS AS ALLOSTERIC MODULATORS OF GABAA RECEPTORS**

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Neuroactive steroids were initially identified as metabolites of the hormone progesterone and deoxycortisone although it was later found that these metabolites functioned as potent allosteric modulators of GABAA receptors. Since a substantial body of evidence supports the role of GABAergic inhibition of dopaminergic function as a means of reducing cocaine self-administration and long term potentiation of dopaminergic neurons, neuroactive steroids may hold great promise as pharmacotherapies for drug addiction. Although endogenous neuroactive steroids such as allopregnanolone have shown unique GABAA modulating properties, they do not have ideal properties as drug substances. Natural neurosteroids can be metabolically converted to hormonally active substances and have poor bioavailability. Consequently, there is an unmet need for synthetic analogs with improved pharmacokinetic and pharmacodynamic properties. In order to better understand the key structural features essential to GABAA activity we have developed a novel series of 11 $\beta$ - and 17 $\beta$ -position substituted steroids having potencies at the GABA receptor equal to or greater than the endogenous neuroactive steroid allopregnanolone. GABAA allosteric potency was evaluated using [3H]flunitrazepam (EC50 and Emax) and [35S] TBPS (IC50) radiolabeled binding in rat cerebral cortex. The most potent derivative (5 $\alpha$ -H, 3 $\alpha$ -OH, 3 $\beta$ -methyl-17 $\beta$ -nitro-11 $\beta$ -dimethylaminophenylpregnane) had an IC50 of 9 nM, an EC50 of 39 nM and an Emax of 135%. Further study of this structural class may lead to more potent and selective GABAA modulators as pharmacotherapies for substance abuse.

## **TREATMENT RESPONSE OF INCARCERATED FEMALE SUBSTANCE ABUSERS**

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Abuse and victimization have been identified as major factors in the life histories of women who have engaged in criminal behavior (Greenfeld & Snell, 1999; Bureau of Justice Statistics, 2001). Female offenders in the Colorado Women's Prison TC study (J.Y. Sacks, 2005), reflecting national samples, report high rates of exposure to trauma and abuse both as children and as adults; 74% cited exposure to sexual violence in their lifetime, 39% before age 14. The present study examines the profiles and 6-month treatment outcomes for a cohort of incarcerated women substance abusers (N=584), many of whom had co-occurring serious mental disorders, randomly assigned to either Therapeutic Community (TC) or cognitive behavioral substance abuse treatment while in prison. The study hypothesizes that: (1) Women in the TC will have better post-prison outcomes, as compared to the women in the cognitive behavioral program, on substance abuse, mental health, crime, and HIV risk behaviors. The core investigation uses a random assignment design with prospective, longitudinal repeated measures, intent-to-treat analyses and four assessment points: baseline (prison entry), 6-months, 12-months and 18-months post-prison exit and employs standard outcome measures (e.g., drug use, crime, psychological symptoms), and specific measures of particular concern to female substance abusers (e.g., trauma exposure, trauma symptomatology). Results: Women in the TC condition had significantly more improvement post-prison, when compared to women in the cognitive behavioral treatment, with regard to psychological symptoms (BDI, BSI), exposure to physical and sexual violence, post-traumatic symptom severity, and serious health problems. Both groups improved equally with regard to drug use. Conclusion: The results of the present study augment our understanding of gender-specific responsiveness to substance abuse treatment and pathways to success that have important implications for informing policy, planning and treatment services for a largely underserved population.

## **STRESS REACTIVITY IN RESPONSE TO PHARMACOLOGIC AND PSYCHOLOGICAL LABORATORY STRESS TASKS: IMPACT OF GENDER AND SMOKING STATUS**

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Evaluation of the HPA axis and subjective stress response to different stress challenges may provide valuable information about the stress-substance use connection. In this study, neuroendocrine (ACTH, cortisol), physiologic (heart rate), and subjective stress responses to two laboratory stress tasks were examined among male and female smokers and non-smokers (N = 38). Participants are the healthy controls" of a larger investigation examining cocaine dependence and HPA axis response; they have no current/history of substance use disorders, PTSD, depression, or major medical illness. Participants completed the SCID, history and physical examination, and laboratory testing after an overnight stay in the General Clinical Research Center at MUSC. While in the hospital, participants completed a) a pharmacologic stimulation challenge in which they were administered corticotropin releasing hormone (CRH) and b) a psychosocial stress task, the TRIER, in which they gave a speech in front of 3 strangers and completed a mathematical task. Measurements were taken before and after each task. In response to the TRIER, women displayed significantly lower ACTH as compared to men, and the data for CRH suggests a similar pattern. In response to the CRH, evidence of a smoking status by gender interaction suggests that among females, smokers demonstrate a smaller change in cortisol in response to the CRH than nonsmokers. The difference in cortisol change among males did not reach significance. Similarly, in response to the TRIER, a smoking status by gender interaction was observed suggesting that, among smokers, females demonstrated a lower cortisol response than males. No significant differences in subjective stress were observed. Although preliminary, the findings increase knowledge about the methodological implications of participant smoking status and gender in human stress reactivity studies. Supported by NIDA grants P50 AR049551; P60-DA05130; DA00049 and UL1RR024143."

## **RISK FACTORS FOR 30-DAY AND 1-YEAR ADULT PRESCRIPTION MISUSE: EFFECT OF GENDER**

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Prescription drug abuse has risen markedly in the past decade, and data from 2001 indicated that over 2.5 million individuals initiated misuse each year (Compton & Volkow, 2006). Despite this, there is little data on gender differences in prevalence rates or on the risk factors for misuse. This study used data from the 2005 National Survey on Drug Use and Health (NSDUH), a nationwide survey of the non-institutionalized population ages 12 to 82, to evaluate potential risk factors for the non-medical use of controlled opioids, stimulants, minor tranquilizers or sedatives. Analysis was restricted to those aged 18 to 82 and was split by gender. Regression analysis was performed (using SUUDAN software; Research Triangle Institute, 2001) examining the predictive utility of demographic and psychiatric variables; for significant predictors, odds ratios were estimated. Of the overall sample of 37,227 adults (17,114 males, 20,113 females), 5.9% reported past year misuse (4.5% opioids, 2.2% tranquilizers,

1.1% stimulants, 0.3 % sedatives); 2.5% reported past 30-day misuse (1.7% opioids, 0.8% tranquilizers, 0.4% stimulants, 0.1 % sedatives). For 1-year prevalence, men were significantly more likely to misuse prescription medications than women (ORs; any: 1.20, opioids: 1.31, tranquilizers: 1.20, stimulants: 1.23), with the exception of sedatives. For 30-day prevalence rates, men were more likely to abuse opioids (OR: 1.20) and had a trend towards greater misuse of any medication (OR: 1.13). For women, misuse of prescription medications was predicted by cocaine use in the past year (1-year ORs: 13.9-32.8; 30-day ORs: 22.4-28) and binge drinking in the past 30 days (1-year ORs: 3.03-6.48; 30-day ORs: 2.59-7.08). For men, being unemployed or disabled tended to predict greater misuse (1-year ORs: 1.7-2.45; 30-day ORs: 2.14-3.99). Daily smoking, past year marijuana use, past year major depression or anxiety generally served as equal risk factors for both genders. Screening for prevention or treatment of prescription misuse can use these findings to target those at highest risk. Supported by NIH grant T32DA007238

#### **GENDER EFFECTS ON LONGITUDINAL MODELS OF MARIJUANA USE AND SEXUAL RISK BEHAVIOR AMONG CRIMINALLY INVOLVED ADOLESCENTS**

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Substance use is clearly an important behavioral cofactor for HIV/STD risk, but the specific relationship between marijuana use and risky sexual behavior remains understudied, particularly for adolescents in the criminal justice system who evidence high rates of both behaviors. The goals of the present project are to examine temporal and longitudinal relationships between marijuana use and condom use in criminally-involved adolescents and to examine whether the model relationships are equivalent across gender. Participants were 435 adolescents on probation who ranged in age from 14 to 17 ( $M = 15.7$ ). Retention rates at six and twelve month follow-up assessments were 88% and 86%, respectively. Consistent with the demographics of the criminal justice system, participants were primarily male (75.3%) and were ethnically diverse. The vast majority of participants (88%) reported having sex at least once, yet fewer than 30% of participants reported “always” using condoms. Substance use was also high such that 93% of females and 89% of males reported having ever having smoked marijuana, and 63% and 69% reported being current users. There was evidence of temporal relationships between marijuana use and risky sexual behavior. For example, marijuana dependence predicted condom use over and above a composite of other drug use ( $B = -.06, p < .05$ ). At last intercourse occasion, the relationship of marijuana use to risky sexual behavior depended on whether the participants’ marijuana use was discrepant from their partners’ marijuana use and relationship status. A cross-lag model was specified in which condom use behavior and marijuana dependency predicted their own respective outcomes at the next immediate time point and in which longitudinal relationships of marijuana dependence to condom use were estimated. In addition to the baseline correlation between marijuana dependence and condom use, gender-specific relationships emerged from marijuana dependence to condom use across time.

#### **MATERNAL TRAUMA EXPOSURE, PTSD, MENTAL REPRESENTATIONS AND CAREGIVING BEHAVIOR: IMPLICATIONS FOR THE MOTHER-TODDLER ATTACHMENT SYSTEM**

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The interface between maternal trauma exposure and symptoms with caregiving behavior has potential implications for distortions in perceptions and interpretations of children’s behavior and for disorganization of attachment behavior. Substance abusing mothers with trauma histories have shown difficulty identifying children’s emotional cues correctly and responding empathically. Using preliminary data from 15 substance abusing mothers of infants and toddlers, we hypothesized that (1) increased maternal exposure to trauma and PTSD symptom severity would be negatively related to balance in maternal mental representations of their toddlers and quality of maternal caregiving behavior; and that (2) balance in maternal representations of toddlers would mediate associations between maternal trauma exposure and PTSD symptom severity, respectively, and quality of maternal caregiving. Measures included: The Working Model of the Child Interview, the NCAST Teaching Scales, and a trauma and PTSD questionnaire. Hypotheses were tested using linear regressions. Given the sample size, effect sizes for  $R^2$  ( $sm=.01, med=.09, lg=.25$ ) were examined to determine magnitude of effects. Maternal exposure to trauma and PTSD symptom severity were each negatively associated with representational balance ( $R^2 = .12, .10$ ) and maternal caregiving behavior ( $R^2 = .10, .07$ ). Representational balance was positively associated with quality of caregiving behavior ( $R^2 = .14$ ) and respectively mediated associations between maternal exposure to trauma (97%) and PTSD symptom severity (100%) with caregiving behavior. Though preliminary, findings suggest that trauma exposure and its implications for maternal mental representations of caregiving are important factors in maternal caregiving behavior.



**THE CO WOMEN'S PRISON PROJECT - PRELIM. OUTCOMES AT 12 MONTHS POST-PRISON EXIT: COMPARING SA BEH., HIV AND OTHER RISK BEH., AND SERV.NEEDS/UTILIZ. OF YOUNG AND MATURE FEMALE OFFENDERS**

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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 (N=610). Preliminary 12-month follow-up data is based on a follow-up eligible study cohort of female offenders (N=511) admitted to the Denver Women's Correctional Facility (DWCF) between Feb. 2002 and December 2005. 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, substance abuse (SA), criminal justice involvement, and other risk behaviors 12 months post prison exit of Young (under age 40), n=175, 72%, and Mature (age 40+), n=69, 28%, female offenders. We further identify self-reported service needs and utilization in these two age groups during the twelve months since their release from prison. The total female offender study cohort is predominantly Caucasian, under-educated, and unmarried; more than 1/3 had been unemployed in the year prior to their most recent arrest; the median age is 35. The women in the study have an extensive LT arrest history. Over 3/4 of them are parents and they have an average of 3 children. While none of the services offered are age-specific, the 2 age cohorts utilized the services at DWCF at similar proportions. Various risk behaviors in the two age groups will be examined to a) identify their service needs, and b) suggest more age-appropriate services for female offenders once they leave prison.

**ROLE OF SEX AND DEVELOPMENTAL HISTORY ON THE ANTINOCICEPTIVE RESPONSE TO ACUTE OXYCODONE IN ADULT RATS**

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Oxycodone is a highly efficacious analgesic thought to act via activation of mu and/or kappa opioid receptors. Because the effects of mu agonists can be influenced by the sex of the subject and past drug exposure, we examined the responses to oxycodone treatment. Female Sprague-Dawley rats were adapted to oral gavage and treated for 28 days with water or oxycodone. Ascending dosing was used, with an initial dose of 5 or 10 (Exp. 1) or 10 mg/kg/day (Exp. 2), which was gradually increased to final doses of 7.5 or 15 mg/kg/day. This was sustained during breeding and pregnancy. Oxycodone was well tolerated and there were no differences between treatments for pregnancy or birth measures. Pups were reared by their biological mothers. In Exp. 1 we assessed nociception in adult rats exposed in utero using a hot plate set at 50, 52, or 55°C (n=4-9 per group). Latencies were temperature-dependent, and there was a significant Sex x Prenatal Treatment interaction, with prenatal oxycodone affecting females more than males. In Exp 2., we examined the response to acute oxycodone treatment in adult rats prenatally exposed to oxycodone or water (n=6 per group). After adaptation to the hot plate and oral gavage procedures, rats were treated with 5 or 10 mg/kg oxycodone for 2 days. Latency to lick the hind paw was recorded prior to treatment and 15, 30, 45, and 60 min post-oxycodone gavage. After 5-mg/kg oxycodone, there was a Sex x Prenatal Treatment x Time interaction. Oxycodone did not increase latency in the males of either group. Within females, prenatal oxycodone treatment altered the time course, with a shift to a more rapid response. For the 10 mg/kg dose there was an overall Sex effect, with females displaying longer latencies than males. Prenatal treatment did not interact. Thus, the analgesic response to oxycodone was affected by gender and prenatal exposure to oxycodone, which has implications for the use and potential abuse of prescription opioids. Supported, in part by the Board of Regents, State of Louisiana, LEQSF RD-A-19 and USPHS DA018181.

**GENDER DIFFERENCES IN DEPRESSION SYMPTOMS AMONG SUBSTANCE USERS: RELATIONSHIP WITH DEPRESSION DIAGNOSIS**

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Gender differences in depression have received increased attention in the general population, but are still relatively unexplored in substance users. Previous results suggest possible gender differences in the clustering of depression symptoms, but interpretation is limited due to sample size and methodological considerations. Moreover, the gender-specific relationship between depression symptoms and depression diagnosis has not been examined in this population. Our goals were to: (a) examine the factor structure of the Beck Depression Inventory - Second Edition (BDI-II) in male and female substance users, and (b) examine the relationship between factor scores and depression diagnosis. The sample consisted of male (N = 711) and female (N = 239) treatment-seeking cocaine, alcohol and opioid users. Depression diagnosis was considered regardless of etiology (i.e., major depression or substance-induced depression). Consistent with previous studies, confirmatory factor analyses using a weighted least square approach suggested that a three-factor model with cognitive, affective and somatic factors best fit the data for the whole sample (CFI = .94, TLI = .99, RMSEA = .07). The fit was acceptable in both genders, and unit-

weight scores were created for each factor. A logistic regression showed that, in male users, the cognitive and affective (but not somatic) factors independently predicted depression diagnosis, yielding an overall 85% correct classification rate. In female users, the cognitive and somatic (but not affective) factors predicted depression diagnosis, with a correct classification rate of 78%. These results suggest that, in male substance users, somatic symptoms may not be a strong indicator of depression diagnosis. The lack of predictive power of the affective factor in the female users should be taken with caution given the small number of items on this factor (4) and the limited size of the female sample. Findings suggest the need for gender-specific screening of depression in substance users.

#### **COCAINE-INDUCED LOCOMOTOR SENSITIZATION DURING CONDITIONING AND LOCOMOTOR RATES DURING TEST MAY PREDICT RESULANT PLACE PREFERENCE IN LACTATING DAMS**

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The postpartum female rat (dam) is uniquely responsive to the hedonic salience of pups, with maternal motivation highest in early and waning in late postpartum. Conditioned place preference (CPP) was used to determine whether responsiveness to the hedonic salience of cocaine also varies across postpartum (Pereira et al. 2007 CPDD). The majority of dams tested during both early and late postpartum preferred chambers associated with intraperitoneally(IP)-injected cocaine (5, 10, or 20 mg/kg) over those associated with saline, with 5 mg/kg eliciting cocaine-associated chamber preference in the greatest number of dams. The relationship between cocaine-associated chamber preference and locomotion (motoric responsivity) during CPP conditioning (drug present) or test (drug absent) is relatively unexplored in the postpartum dam. Locomotion was recorded within each CPP conditioning chamber following cocaine and saline injections across four consecutive days of conditioning. During conditioning, cocaine increased locomotion over saline baseline in all dams; this increase was modest after 5 mg/kg ( $p<0.05$ ) and dramatic after the two other doses ( $p<0.0001$ ). Locomotion also increased substantially between the first and fourth injections of 10-20mg/kg, indicating drug sensitization ( $p<0.0001$ ); no sensitization occurred after 5 mg/kg. During test, locomotor rate was consistently lower ( $p<0.05$ ) in the cocaine-associated chamber among dams that preferred that chamber, compared to their locomotion in the saline-associated chamber, providing a measure of preference-related behavior that may covary with chamber time. Cocaine-associated place preference developed regardless of the strength of locomotor response following injection or locomotor sensitization during conditioning. The CNS mechanism mediating the hedonic value of a cocaine dose is thus separable from that mediating a sensitized locomotor response to drug in the postpartum dam. J.I.M.: March of Dimes#12-134, DA014025

#### **CHANGES IN MOOD, PERFORMANCE, FOOD CRAVING AND FOOD INTAKE ACROSS THE MENSTRUAL CYCLE IN WOMEN WITH PREMENSTRUAL DYSPHORIC DISORDER**

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It has been shown that women with premenstrual dysphoric disorder (PMDD) report negative mood, increased alcohol intake, and increased food cravings and intake premenstrually. However, few studies have examined changes in cognitive performance in women with PMDD. The present study compared mood and various performance tasks in 14 women who met DSM-IV criteria for PMDD to 15 control women. All normally cycling women had a total of ten sessions: two practice sessions, 4 sessions during the follicular phase and 4 sessions during the late luteal phase of the menstrual cycle. Each session, participants completed a Balance Task (a motor coordination task), food-related questionnaires, mood questionnaires and cognitive tasks, including the Digit Recall Task, Word Recall Task and Digit Symbol Substitution Task (DSST). Based on Daily Rating Forms, there was a significant decrease in overall mood, in the luteal phase in the PMDD group compared to the control group. Similarly, Beck Depression and State Anxiety scores were significantly increased in the luteal phase among women with PMDD compared to the follicular phase and compared to women without PMDD. Correspondingly, during the luteal phase, women with PMDD showed impaired performance on the Balance Task, the Word Recall Task and the DSST compared to the follicular phase and compared to women without PMDD. Women with PMDD also showed increased desires for savory and sweet foods in the luteal phase compared to the follicular phase and compared to women without PMDD. However, there were no changes in the number of calories consumed as a function of menstrual cycle phase or group. Taken together, women with PMDD not only experience dysphoric mood during the luteal phase, but they also experience impaired cognitive performance. Thus, alcohol and other drug use during the luteal phase could potentially result in more pronounced cognitive and performance impairment in women with PMDD. Supported by DA 009114, K02 00465, T32 007294.

### **DEVELOPMENTAL AND HORMONAL EFFECTS ON INFLAMMATORY RESPONSES TO PAIN IN FEMALE RATS**

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Estrogen attenuates the behavioral responses to inflammation-induced pain. However, it is unclear if estrogen mediates its antihyperalgesic effects through regulation of the peripheral nervous system. To this end, paw sizes of naïve and formalin-treated rats (5% injection into the intraplantar region of the right hind paw) were measured at different developmental stages [peri-adolescent (3 weeks), adolescent (6 weeks), adult (8 weeks), or aged (52 weeks)], at different stages of the estrous cycle (proestrus, estrus, metestrus, or diestrus), or after ovariectomy (OVX). To determine the effect of estrogen on paw size, some rats from the OVX group were implanted with a 20% Estradiol- $\beta$  Silastic capsule. In all experimental groups, formalin significantly increased paw size compared to naïve groups. Further, a developmental effect on formalin responses was observed; adult rats given formalin had significantly lower paw size than peri-adolescent and adolescent rats ( $p < 0.005$ ), and aged rats' paw size was significantly smaller than all other age groups ( $p < 0.005$ ). However, neither estrous cycle nor hormonal replacement altered the formalin-induced increases in paw sizes. Taken together, our results suggest that although age is a factor contributing to peripheral inflammation, hormonal effects (either via hormonal replacement and/or endogenous physiological fluctuations) play a limited role. Supported by: SCORE 506-GM60654, MIDARP DA12136, and SNRP NS41073.

### **GENDER DIFFERENCES IN MOP-R MRNA LEVELS IN LONG-EVANS RATS**

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Earlier studies have shown that neonatal maternal separation in rats results in significantly decreased sensitivity to morphine-induced antinociception, higher global withdrawal scores during spontaneous morphine withdrawal, and greater locomotor sensitization to morphine. Further studies have shown gender differences in antinociceptive effects and degree of physical dependence on opiates and increased binding of the  $\mu$ -opioid receptor (MOP-r) in females. These results suggest that maternal separation causes long-term alterations of the MOP-r system. Consequently, the current study examined the effect of maternal separation on gender differences in the levels of MOP-r mRNA for regions known to be important in nociception, locomotor activity, and drug abuse. Twelve male and twelve female rats were divided into a non-handled group and a maternal separation group in which animals were removed from their mothers for 3-6 hours/day for the first 12 days of life and a total of 24 hours on days 3 and 4. Individual animals were sacrificed, brain regions were dissected, and the mRNA was isolated. Solution hybridization/RNase protection was used to measure MOP-r mRNA levels in the caudate putamen and the thalamus. A 2-way ANOVA, Sex by Condition (non-handled vs. maternal separation) showed that adult female rats had significantly higher levels of MOP-r mRNA in the caudate putamen ( $F(1,20)=6.15, p < 0.03$ ) than the adult male rats. There was no effect of separation on MOP-r mRNA in the caudate putamen. Adult female rats exhibited a trend towards higher MOP-r mRNA levels compared to adult male rats, although the increase was not significant ( $p=0.076$ ). These data indicate gender and region specific differences in MOP-r mRNA levels. This work was supported by NIH-P60-DA-05130 and NIH-K05-DA-00049 to M.J.K. and NIH-R01-DA-14122 and NIH-K05-DA-00008 to S.G.H.

### **THE EFFECTS OF SOCIAL AND ENVIRONMENTAL ENRICHMENT ON COCAINE SELF-ADMINISTRATION IN FEMALE RATS**

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Previous studies conducted in male rats have reported that social and environmental enrichment enhances sensitivity to the locomotor and rewarding effects of psychomotor stimulants. Relatively few studies have examined these types of manipulations in female rats, and thus it is less clear whether females are similarly sensitive to these effects. The purpose of the present study was to determine whether social and environmental enrichment enhances sensitivity to the positive-reinforcing effects of cocaine in female rats. Rats were obtained at weaning and randomly assigned to one of two housing conditions: isolated rats were housed individually with no visual or tactile contact with other rats; enriched rats were housed in groups of four in large cages and given novel objects on a daily basis. After six weeks under these conditions, rats from both groups were surgically implanted with indwelling venous catheters and trained to self-administer cocaine on a fixed-ratio 1 (FR1) schedule of reinforcement. Once self-administration was acquired, cocaine was made available on a progressive ratio (PR) schedule and breakpoints were obtained for various doses of cocaine in both groups of rats. Enriched rats acquired cocaine self-administration in fewer days than isolated rats on the FR1 schedule of reinforcement. On the PR schedule, breakpoints were greater in enriched rats than isolated rats when responding was maintained by both low

(0.3 mg/kg/inf) and high (1.0 mg/kg/inf) doses of cocaine. These data suggest that social and environmental enrichment enhances sensitivity to the positive-reinforcing effects of cocaine in female rats.

#### **SELF-ADMINISTRATION OF INTRAVENOUS NICOTINE IN MALE AND FEMALE SMOKERS**

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Although nicotine is the main addictive chemical in tobacco, it has been difficult to model self-administration of pure nicotine in humans. The goal of this study was to test the parameters of an intravenous (IV) nicotine self-administration model using nicotine doses within the range of those of average intake from smoking. Six male and 4 female smokers participated in a double-blind, placebo-controlled, crossover study, which consisted of 1 adaptation and 3 experimental sessions. In each experimental session, subjects were randomly assigned to one of the 3 doses of nicotine (0.1, 0.4 or 0.7 mg). The lowest nicotine dose, 0.1 mg, was chosen to be approximately equivalent to the amount of nicotine inhaled from 1 puff of a cigarette. During each experimental session, subjects first sampled the assigned nicotine dose and placebo and then had the opportunity to choose between nicotine and placebo for a total of 6 choices over a 90-minute period. Out of 6 options, the average (SEM) number of nicotine choices were 3.0 (0.48) for 0.1 mg, 4.7 (0.48) for 0.4 mg and 4.5 (0.46) for 0.7 mg, indicating a significant effect of nicotine dose on nicotine choice. Both the 0.4 and 0.7, but not the 0.1 mg, nicotine doses were preferred to placebo. These higher doses also produced increases in heart rate, blood pressure and ratings of “drug liking” and “high”. Overall, these findings indicate that smokers chose both the 0.4 and 0.7 mg nicotine doses over placebo. Our model may be useful in the evaluation of both behavioral and pharmacological manipulations on nicotine self-administration in humans.

#### **ROLE OF INDIVIDUAL, TREATMENT, AND POST-TREATMENT FACTORS ON SUSTAINED REMISSION: EXAMINING GENDER DIFFERENCES**

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Severely dependent substance users have low rate of treatment completion and rarely maintain treatment gains. Studies have examined individual and program-level factors as predictors of outcome but few integrate these domains into a comprehensive model or examine gender differences. This study (1) tests a comprehensive model integrating individual, treatment and post-treatment domains as predictors of sustained remission; and (2) examines whether predictors differ by gender. Consecutive admissions at 2 publicly funded outpatient programs in NYC were interviewed within 2 weeks of admission (BL), treatment end (DIS) and a year later - 1YR (full dataset N = 219; 45% women). Hypothesized predictors of completion were degree of program 12-step orientation, length of stay (LOS), and BL measures of remission-promoting cognitions, social support, satisfaction with counselor and treatment helpfulness. Hypothesized predictors of 1YR remission were DIS level of these domains and continuous post-treatment 12-step attendance. Participants were polysubstance users dependent on crack and/or heroin. There was no gender difference in clinical history; 42% completed treatment, 21% sustained abstinence at 1YR. Women were more likely to complete treatment but did not differ from males in remission rates. Controlling for BL abstinence length and dependence severity, motivation, LOS, program ‘12-steppedness’ and counselor rating predicted completion for the total sample; among males, motivation, LOS and program orientation predicted completion; for women, motivation, LOS and counselor rating. Program completion, continuous 12-step attendance and DIS recovery motivation predicted sustained 1YR remission overall (motivation and program completion predicted 1YR remission among men; DIS self-efficacy, completion and continuous 12-step attendance predicted 1YR remission for women). Findings emphasize the importance of considering simultaneously individual and treatment domains and to examine gender differences in treatment and remission processes. Funded by NIDA Grant R01 DA015133.

#### **FACTORS ASSOCIATED WITH SUBSTANCE ABUSE TREATMENT UTILIZATION AMONG MALE AND FEMALE INCARCERATED SUBSTANCE USERS**

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Research suggests there are gender differences in drugs of choice, age of drug use initiation, drug treatment barriers, and drug abuse consequences. However, literature on differences in correlates of drug treatment utilization for males and females has received limited attention, particularly among offenders. This presentation will describe independent correlates of community treatment utilization for male and female offenders participating in prison-based treatment. Method: As part of the NIDA funded CJDATS cooperative agreement, this protocol (Transitional Case Management, Prendergast, PI) was implemented in four collaborating research centers.

Male (n=506) and female (n=153) participants were recruited from prison-based treatment programs within the final three months of their target release date. Bivariate and multivariate analysis were conducted to determine the independent correlates of treatment utilization. Results: After adjustment for control variables, findings indicate that males who entered treatment were more likely to be older, had a history of crack use, had a greater number of arrests, and had been arrested for prostitution or pimping. Females who entered treatment were 2.52 times more likely to have been hospitalized for a health condition and 2.35 times more likely to have a history of crack use. Implications: The specific factors associated with substance abuse treatment utilization prior to incarceration, which differed by males and females, may have important implications for aftercare service utilization in the community following release. Since the literature is consistent in noting that in-prison substance abuse treatment is most effective when followed by aftercare treatment in the community, these findings suggest that an individualized, gender-specific approach to re-entry planning and transitional case management is needed and should be a priority for correctional and community treatment providers.

#### **METHAMPHETAMINE USE AND HIGH-RISK SEXUAL RISK BEHAVIORS AMONG INCARCERATED FEMALE ADOLESCENTS WITH A SEXUALLY TRANSMITTED DISEASE IN LOS ANGELES COUNTY JUVENILE HALLS**

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Hypothesis: Methamphetamine use is associated with high risk sexual behaviors. We hypothesized that STD infected, incarcerated females who reported recent methamphetamine use would be more likely to engage in high risk sexual behaviors than individuals who reported no methamphetamine use. Project Yes! is a public health program located in the Los Angeles County Juvenile Halls that provides STD treatment and case management to incarcerated adolescent females between the ages of 9 and 19 who are diagnosed with chlamydia or gonorrhea while in custody. Procedures: Self-reported drug use and sexual risk behaviors among incarcerated adolescent females with an STD diagnosis were examined from 200 client interviews conducted between January-December 2006. Statistical analysis: Logistic regression was used to determine predictors of methamphetamine use. Results: Mean results were as follows: age at arrest (16.0), age of first sexual experience (13.0) and number of lifetime sexual partners (6.0). STD diagnoses were as follows: chlamydia (65%), gonorrhea (19%) or both (16%). Daily or weekly drug use was reported for methamphetamine (21%) and marijuana (72%). In multivariate analysis, regular methamphetamine users were more likely to have a prior diagnosis of chlamydia or gonorrhea in the year before their arrest (OR=8.11;  $p<.01$ ), more likely to be Hispanic (OR=7.90;  $p<.000$ ), and more likely to be a first time arrestee (OR=1.37;  $p<.05$ ). Conclusions: The recognition of drug-related problems among incarcerated, STD infected adolescents increases the need for interventions that address the underlying risk behaviors for both drug use and risky sexual behaviors among female juvenile offenders. Public health workers who provide services to this population are ideally suited to identifying early drug problems in adolescents through screening, referrals to drug treatment and post-release case management.

#### **CHANGING GENDER TRENDS IN ADOLESCENT DRUG USE**

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The aim of this study is to examine gender differences in youth drug use while taking into consideration gender differences relating to youth depression and disruptive behavior symptoms. Data for this study come from the public-use data files for the 2005 National Survey of Drug Use and Health (NSDUH), a nationally representative sample of non-institutionalized U.S. residents aged 12 and older. This study utilized a sample of 18,678 NSDUH respondents between the ages of 12 to 17 years old. The 2005 NSDUH included items indicating whether or not participants had ever tried tobacco, alcohol, marijuana, and other drugs. The survey also included items pertaining to youth depression and disruptive behaviors. Participants were divided into four psychological profile groups: 1) no/low depression or disruptive behaviors (NEITHER), 2) no depression, but 3+ disruptive behaviors (DISRUPT), 3) diagnosis of depression, but low disruptive behaviors (DEPRESS), and 4) co-occurring depression and 3+ disruptive behaviors (CO-OCCUR). Without stratification by psychological symptoms, boys were more likely than girls to use tobacco. Conversely, girls were more likely than boys to report alcohol use and the use of drugs other than alcohol, tobacco, or marijuana. A gender difference was not present for marijuana use. After stratifying by psychological profile group, further gender differences were found. In the NEITHER group, boys were still more likely than girls to use tobacco, but for the DEPRESS group, girls were more likely than boys to use tobacco, alcohol, marijuana, or other drugs. For the DISRUPT group, girls were more likely than boys to use alcohol, marijuana, or other drugs, and in the CO-OCCUR group, girls were more likely than boys to use drugs other than tobacco, alcohol, or marijuana. These results may indicate a shift in a longstanding drug use gender trend: boys may no longer be more likely than girls to use drugs. Future preventative interventions may benefit from focusing on adolescent girls with symptoms of depression and disruptive behaviors. Funding: NIDA T32DA0725714

### **PREDICTING MEDICAL CARE ACCESS AMONG OUT-OF-TREATMENT DRUG-USING WOMEN**

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Women enrolled in HIV prevention studies have high-risk behavior that put them at risk for other medical problems. The NIDA-funded Women Teaching Women HIV prevention intervention study provided an opportunity to characterize chronic medical problems, and medical treatment, while also predicting medical treatment received in the 12 month follow-up period among 451 out-of treatment street-recruited drug users. At baseline, 71% reported 12-month medical care in doctor's offices, clinics or hospital outpatient services; 41% reported being under a doctor's care for at least one condition such as diabetes, cancer or another physical illness and 40% said their health was fair or poor. By the 12 month follow-up, 342 (76%) of the women had received such medical care, 72 (21%) of whom had reported no care at baseline. Most care occurred in community health centers or clinics (76%). A multivariate model consisting of past health problems, drug use (more than 5 times used marijuana, stimulants, cocaine, amphetamines, sedatives, or opiates), wanting to talk to a doctor because of alcohol use, any insurance, income from a job or business, income from welfare, receipt of health care, receipt of mental health treatment, and receipt of drug treatment in the past 12 months was used to predict receipt of medical care in the 12 months since baseline. These variables were chosen based on the literature and the Anderson model of health care access. Receipt of health care prior to baseline increased health care received during the follow-up period (OR 1.42, 95% CI 1.26,1.59), as did receipt of mental health treatment since baseline (OR 1.22, 95% CI 1.06,1.42) (Likelihood Ratio Chi-Square 47.73 [df=2], $p<.0001$ ; ROC=0.70). Receipt of mental health and physical health care are associated in this population and likely facilitate entry into each.

### **MATERNAL REPRESENTATIONS, REFLECTIVE FUNCTIONING, AND CAREGIVING BEHAVIOR: IMPLICATIONS FOR INTERVENTION DEVELOPMENT**

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Many abused substances are known to affect central dopaminergic pathways that are also critically involved in adult human capacities to invest in child care. Attachment theory suggests that a parent's capacity to invest in a child's wellbeing is largely a function of the caregiver's mental representations of the caregiving relationship which, in turn, influences caregiving behavior through the metacognitive capacity to conceive of a child's behavior is driven by underlying intentional states (i.e. reflective functioning). Using data from 8 completers of a 20-week attachment-based intervention, we predicted that (1) improvement in maternal representational balance (MRB) and reflective functioning (MRF) would correspond to a reduction in illicit drug use, improvement in maternal caregiving behavior and reduction in toddler distress; (2) improvement in MRF would mediate associations between improvement in MRB and improvement in caregiving behavior; and (3) improvement in maternal caregiving behavior would mediate associations between improvement in MRF and reduction in toddler distress. Measures were: The Working Model of the Child and Parent Development Interviews, NCAST Teaching Scales, and Bi-weekly urine tox screens. Improvement in MRB and MRF corresponded with a decrease in illicit drug use ( $R^2 = .16$  for RB,  $.68$  for RF), improvement in caregiving behavior ( $R^2 = .39$  for RB,  $.36$  for RF), and a decrease in toddler distress ( $R^2 = .28$  for RB,  $.45$  for RF). Improvement in MRF mediated 51% of the association between improvement in MRB and improvement in caregiving behavior. Improvement in caregiving behavior mediated 93% of the associations between improvement in RF and reduction in toddler distress. Findings are consistent with growing evidence that change at the representational level (e.g. MRB and MRF) are critical to change at the behavioral level of caregiving, and therefore have implications for future intervention development.

### **PATTERNS OF PRESCRIPTION DRUG MISUSE, ILLICIT DRUG USE, AND MENTAL HEALTH PROBLEMS IN THE MIAMI CLUB CULTURE**

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Prior research indicates that there has been a significant incursion of prescription drugs into the Miami club scene, and suggests that young club drug users may be at risk for serious health consequences. The present study is assessing the extent of prescription drug misuse among club drug users, and examining gender differences in the health consequences of prescription drug misuse. This study is recruiting 750 club and prescription drug users through respondent-driven sampling, and conducting structured baseline and follow-up interviews at 6, 12 and 18 months. To date, 174 participants have completed baseline interviews: the sample has a median age of 26, is 66.7% male, and is 47.7% Hispanic, 35.8% White-Anglo, and 9.7% African American. Participants reported serious drug involvement in the 90 days prior to interview: 96.0% used alcohol, 92.0% cocaine, 89.1% non-prescribed benzodiazepines, 88.5% marijuana, 68.4% ecstasy, and 55.7% used non-prescribed opioids. With the exception of higher Valium misuse among females ( $p=.04$ ), no gender differences are apparent in the types of drugs abused. In terms of frequency of use, however, males reported using alcohol ( $p=.03$ ) and marijuana ( $p=.04$ ) on significantly more days than females, while females used crack cocaine and Valium with significantly greater frequency than

males. Preliminary examination of DSM-IV abuse and dependence measures yielded no gender differences on any of the substances examined, and to date only small proportions of the sample meet criteria for abuse and/or dependence of any prescription drug. Despite similar levels of drug involvement, however, females were significantly more likely to report mental health problems than males, including depression ( $p=.001$ ), anxiety ( $p=.001$ ), and general mental distress ( $p=.01$ ). These data suggest that although abuse/dependence is somewhat low, the widespread use of numerous drugs places members of the club culture at high risk for health problems. Females, in particular, appear to be disproportionately impacted by serious psychiatric co-morbidities.

#### **WHITE MATTER ORGANIZATION AND SUBSTANCE USE DISORDERS: A PRELIMINARY STUDY IN ADOLESCENTS AND YOUNG ADULTS**

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Recent studies of adolescent brain development indicate that, while maximum brain volume is achieved in early adolescence, white matter development continues into early adulthood, particularly in frontal regions. White matter abnormalities have been observed in adults with substance use disorders (SUDs) using structural and diffusion tensor MRI. In this preliminary study, we investigated white matter microstructural organization in adolescents and young adults. Seven subjects with SUDs were compared to 17 subjects without SUDs who were similar on age and gender composition. We predicted that SUDs would be associated with lower frontal white matter organization as measured by fractional anisotropy (FA). Diffusion tensor imaging was performed to collect a series of 3mm slices with 0mm slice gap. Forty-six slices at B0 and in each of 12 directions were obtained. DTI data were preprocessed using FSL (Smith, 2004). Voxelwise statistical analyses of resulting FA were carried out using TBSS (Tract-Based Spatial Statistics; Smith, 2006). TBSS projects all subjects' FA data onto a mean FA skeleton, before applying voxelwise cross-subject statistics. Compared with the reference group, the SUD group exhibited clusters of significantly lower FA in frontal cortical regions, specifically in the left middle and inferior frontal gyri. Left inferior frontal gyrus FA values were significantly correlated with performance on the Tower of London (Pearson's  $r=0.57$ ,  $p<0.01$ ) and Trail Making Tests (Pearson's  $r=0.46$ ,  $p<0.01$ ), after controlling for age. These preliminary results indicate that adolescents and young adults with SUDs show poorer white matter organization in specific regions of the brain involved in executive function tasks. Future studies with larger samples are needed to elucidate the associations among SUDs, white matter organization and neurobehavioral functioning, as well as to investigate possible recovery of function with abstinence.

#### **MATERNAL NICOTINE EXPOSURE AND CHARACTERISTICS OF ADOLESCENT SMOKING BEHAVIORS: PRELIMINARY FINDINGS**

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Evidence has shown that adolescents are at heightened susceptibility for nicotine dependence if exposed to maternal smoking in utero. Maternal nicotine exposure has also been shown to increase an adolescent smoker's vulnerability to withdrawal and relapse. Extending previous research findings, we are exploring if maternal smoke exposure might affect smoking characteristics among our sample of tobacco dependent treatment seeking adolescents. In the current analysis of 27 smoking adolescents (mean age 15.4 SD 1.3 years, 59% female, 71% Caucasian, mean years smoking 3.0), over half ( $n=16$ ) experienced some level of fetal nicotine exposure. Approximately 85% of exposure occurred for at least seven months of gestation. Participants whose mother smoked while pregnant had slightly higher scores on the Fagerström Test for Nicotine Dependence questionnaire (6.9 versus 5.3,  $SD=2.4$ ) and consumed their first cigarette at a younger age (12.1 versus 13.2 years,  $SD=2.1$ ). Mothers who smoked were slightly less likely to breastfeed (4% compared to 29% of non-smoking mothers). No differences were seen in the elapsed duration of lactation between smoking and non-smoking mothers. From these early findings, we will continue to explore smoking patterns, dependence, and cessation in a larger sample to enhance the understanding of maternal nicotine significance. Supported by the NIH Intramural Research Program, NIDA.

#### **THE DAILY STRUGGLE: A QUALITATIVE STUDY OF THE PROCESS OF LONG-TERM ABSTINENCE FROM HEROIN USE AMONG FEMALE EX-OFFENDERS**

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Heroin use is associated with higher rates of infectious diseases such as hepatitis, endocarditis and the HIV virus than other drugs of abuse. Despite various interventions, long-term recovery rates from heroin use continue at low levels. This poster presentation reports findings from a study that investigated the process of maintaining abstinence as experienced by a sample of former heroin using ex-offenders. The original study sample, consisting of fifteen males and ten females was ethnically diverse: 40% African American, 44% Latino and 16% White (non-

Latino). In-depth interviews were conducted with former users who when active, used the drug daily for at least a year, encountered involvement with the criminal justice system related to their heroin use and have remained abstinent for a period of five years or longer. This presentation, focusing on the female sub-sample, examines various domains, including drug use histories, criminal behaviors, health status and familial interaction. As demonstrated by study respondents, when addressing triggers threatening sustained abstinence, re-entering individuals often sought the advice of “like others,” who given their own experiences, failures and successes, provided guidance and support, enhancing the recovery efforts of both parties. This process was further enhanced when “like others” had additional factors in common, such as gender, culture and life experiences. Difficulties associated with successfully re-entering post-incarceration are many. This process is further compromised by the stigma and structural barriers posed by prior criminal and drug use histories. Overcoming this stigma is itself a process. Ongoing successes experienced and shared by peer networks facilitated this difficult process for this group of female ex-offenders.

#### **POLYDRUG USE MODELS AMONG WOMEN IN THE AUTONOMOUS REGION OF VALENCIA, SPAIN**

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Polydrug use has become the most common pattern among problem drug users, and it entails a greater chance of harm, especially when drugs of unknown content and purity are combined. From a gender perspective, there is a dearth of specific studies about polydrug use among women in general population. Aim: This study aimed at analysing the reality of substance use among women in the Autonomous Region of Valencia, Spain. Method: a sample of 2400 women living in the Autonomous Region of Valencia was selected, aged 16 years and older. A 128 item survey was designed including variables such as demographic data, tobacco and alcohol use, other drugs use, substance-use related motivations and problems, risk factors and couple relationships. A descriptive and factorial analysis was carried out. Results: among Valencian women, 57,3% did not use drugs, 31,8% used one substance and 11% used 2 or more drugs at the same time. Cocaine and MDMA users have a higher rate of polydrug use (3,10 and 3,92 substances). Four basic polydrug use models came up (explained variance: 50,5%), marginal substances, psychostimulants, cannabis/legal substances, and tranquilizers/hypnotics, which are related to four different women profiles. Conclusions: specific preventive and treatment interventions should be addressed from a gender perspective to specific target populations according to their polydrug use models.

#### **ESTROGEN ENHANCES CONDITIONED PLACE PREFERENCE TO COCAINE**

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Behavioral sensitization to cocaine can be used as a tool to study motivational components of addictive behavior. Using this model, our laboratory, and that of others, have found that estrogen enhances behavioral sensitization to cocaine. The present study was designed to investigate if estrogen also affects rewarding aspects of addictive behavior. Female rats were ovariectomized (OVX) and half received estrogen replacement (5 mm Silastic tubing implant filled with estradiol benzoate) (OVX-EB). After a week, rats were placed in the Conditioned Place Preference (CPP) testing chamber and allowed to move freely among the two distinct sides of the testing chamber for 15 min (Day 1). The side of the chamber they spent more time in was designated as their preferred side. The following 4 days, rats were injected daily on the non-preferred side with cocaine and 4 hours later, on the preferred side with saline. The opening between the chambers was closed and rats remained in the side they had been injected for the following 15 min. On day 6 rats were placed in the CPP testing chamber and allowed to move freely among the two distinct sides of the testing chamber for 15 min. The amount of time spent in each side of the chamber was calculated to determine if rats injected with cocaine changed their side of preference. After cocaine injection, OVX-EB rats spent more time in the side of the chamber where they were injected with cocaine whereas OVX rats did not show this increased preference for the cocaine injection side. These data show that estrogen enhances motivational and rewarding aspects of addictive behavior, indicating that gonadal hormones can affect the response to drugs of abuse and most probably can also affect pharmacotherapy outcome. This work was partially supported by NINDS U54NS39405, NIGMS S06-GM08224 and R25Gm61838.

#### **CHARACTERISTICS OF ALCOHOLICS WITH COMORBID ANXIETY OR DEPRESSION IN AN ONGOING, PLACEBO-CONTROLLED TRIAL OF ACAMPROSATE**

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There have been numerous studies evaluating the use of acamprosate in the treatment of alcohol dependence. However, to date, there are no studies evaluating acamprosate in alcoholics with comorbid anxiety or depression. The current study is an ongoing, placebo-controlled trial of acamprosate in the treatment of alcoholics with



comorbid anxiety or depression. Substance use and psychiatric diagnoses were determined by the MINI International Neuropsychiatric Interview. Alcohol use was assessed using the Time Line Follow-back as well as breathalyzer readings. Pertinent assessments include: Montgomery Asberg Depression Rating Scale (MADRS), Hamilton Anxiety Rating Scale, and the Obsessive Compulsive Drinking Scale (OCDS). To date, 34 individuals have been screened and 19 (14 M, 5 F) have been randomized. Of those randomized, all met criteria for alcohol dependence, and 94.7% (n=18) had major depression. The majority of participants (n=14) had lifetime comorbid anxiety disorders. The average age was 36.9 (9.6) years; mean years of education was 11.6 (1.7) and the majority of participants were Caucasian (89.5%; n=17) and unmarried (78.9%; n=15). At the time of randomization, 3 participants were currently receiving an antidepressant medication. For those randomized, the mean baseline MADRS score was 12.6 (8.5) and the mean HAM-A score was 13.7 (9.6). Baseline mean days drinking in last 30 days was 13.7 (8.3), and average drinks per drinking day was 15.8 (14.0). Interestingly, in this current sample, baseline drinks per drinking day were statistically higher for women compared to men (17.5 (25.5) vs. 15.2 (8.6), respectively;  $p=0.022$ ). Baseline OCDS score was 23.1 (8.6), with similar scores between men and women. To date, this sample represents a group of moderately ill alcoholics with significant symptoms of anxiety and depression. The results of this study will be the first to evaluate the effect of acamprosate on drinking outcomes in anxious and depressed alcoholics.

#### **THE ASSOCIATION BETWEEN DRUG USE AND INTIMATE PARTNER VIOLENCE AMONG PREGNANT WOMEN: THE IMPORTANCE OF THE RECIPIENT-PERPETRATOR DISTINCTION**

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Previous research clearly links drug use and intimate partner violence (IPV) among women, including pregnant women (Tuten et al., 2004; Velez et al., 2006). However, research as well as clinical efforts often assume that women are victimized by violence far more frequently than they participate in violence. Very little is known about (a) the actual proportions of women who report IPV victimization vs. IPV perpetration; or (b) whether this distinction has ramifications in terms of drug use or other risk factors. The current study examined the prevalence and patterns of drug use and IPV among 96, low-SES (predominantly African American) pregnant women attending routine prenatal care in an urban hospital setting. All participants used an audio-enhanced computer-assisted self-interview to complete two subscales of the Conflict Tactics Scale—II as well as measures of drug use and a range of other risk factors. In this sample, among the 76 (77%) of women who reported having a partner, 47% reported higher levels of IPV perpetration than victimization; 15% reported more IPV victimization than perpetration; and 38% reported no intimate partner violence. Comparisons of these three groups in terms of drug use, problem alcohol use, partner substance abuse, smoking, and depression suggested clear differences between women reporting IPV and those not reporting IPV, but few differences between the two IPV subtypes. Notably, however, women primarily experiencing victimization were more likely to report alcohol abuse among their partners than women primarily committing violence (55% vs. 22%),  $X^2(1, N = 47) = 4.2, p = .05$ . These findings suggest that among pregnant African-American women who do report IPV, most may report more perpetration of than victimization by violence. These findings also suggest that these subtypes may have different patterns of external risk factors, and that these differing characteristics should be considered in prevention and treatment planning with this population.

### **GENDER DIFFERENCES IN THE EFFECTS OF ALCOHOL ON EMOTIONAL REGULATION IN SOCIAL DRINKERS**

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Previous self-report studies have suggested that emotional coping strategies may differ by gender with men being more likely than women to consume alcohol to cope with stress. Although emotional regulation is an important motivator of alcohol use, it is not known whether there are gender differences in the effects of alcohol on objective physiological indexes of emotional arousal. This study focused on characterizing a potential mechanism that may underlie gender differences in the propensity to use alcohol to regulate emotions. We examined gender differences in the effects of alcohol on the sympathetic nervous system (SNS), which plays an important role in regulating autonomic arousal. Emotionally valenced and appetitive picture cues were presented to 36 healthy young social drinkers (16 women) who were assigned to one of three beverage conditions (alcohol, placebo, control). Mean skin conductance (SC) level, standard deviation of SC level, and mean SC amplitude during the presentation of 6 types of emotionally-valenced (negative, positive, neutral) and drug-related (alcohol, marijuana, poly-drugs) cues were assessed. On all three measures, men in the control group consistently showed heightened SC response to cues compared to women in the control group (medium to large effect size differences). Further, in the alcohol group, men consistently showed reduced SC response to picture cues compared to women (medium to large effect size differences). Thus, men were more reactive to emotionally-arousing and appetitive stimuli, and more sensitive to the arousal dampening effects of alcohol than were women. This differential SNS response may be one mechanism that promotes the greater tendency of men to use alcohol to cope with stress as compared to women.

### **PREDICTORS OF ADULT VICTIMIZATION AMONG HIGH RISK, COCAINE-USING WOMEN**

*K. Vaddiparti, C. Callahan, A. Ben Abdallah and L.B. Cottler, Psychiatry, Washington University School of Medicine, St. Louis, MO*

Victimization puts drug using women at an elevated risk for HIV and other health related risks; it is crucial to understand this phenomenon in order to intervene effectively to reduce negative outcomes. The objective of this analysis is to identify predictors of victimization in adulthood among 441 out-of-treatment, cocaine-using women recruited for a NIDA-funded (DA11622, PI Cottler) community based HIV prevention intervention study. The women were predominantly African American (86%), with a mean age of 38 years (SD=6.7). Women were stratified into two groups: those who reported any physical, sexual, or emotional victimization in the past 12 months (64%) and those who denied all forms of victimization in the past 12 months (36%). Descriptive statistics using Chi-square and t-test were performed to compare the two victimization sub-groups on their demographic characteristics, sexual behaviors and psychiatric morbidity. Bi-variate analysis showed that women who were victimized in the past 12 months were more likely than non-victims to have experienced abuse in childhood before age 15 (52% vs. 18%). Likewise, women who were victimized recently were more likely than non-victims to have ever traded sex (66% vs. 46%), met criteria for DSM-IV lifetime major depressive disorder (47% vs. 17%), cocaine dependence (86% vs. 71%) and lifetime antisocial personality disorder (91% vs. 66%). Logistic regression was performed to analyze independent predictors of victimization in adulthood. Logistic regression confirmed childhood abuse (OR 3.45, 95% CI 2.09-5.67), lifetime major depressive disorder (OR 2.85, 95% CI 1.70-4.80) and lifetime antisocial personality (OR 2.98, 95% CI 1.66-5.35) were the strongest predictors of adult victimization among these drug using women and that the association was strong. These findings indicate that clinicians and service providers dealing with drug using women need to be cognizant of victimization and the factors that contribute to victimization and intervene accordingly for better outcomes.

### **THE EFFECT OF INTIMATE PARTNER VIOLENCE ON RECEPTIVE SYRINGE SHARING AMONG YOUNG FEMALE INJECTION DRUG USERS: AN ANALYSIS OF MEDIATION EFFECTS**

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Background: Intimate partner violence (IPV) has been associated with risky sexual behavior among drug-using women. Few studies have evaluated its association with injection-related risks. We hypothesized that female injection drug users (IDUs) who were victims of IPV would engage in more receptive syringe sharing (RSS). Methods: 797 female IDUs with  $\geq 1$  main sex partner were recruited from five cities in the United States as part of a behavioral intervention trial. Baseline data were analyzed with linear regression models and Sobel tests to determine whether self-efficacy for safer drug use, self-esteem, and depression independently mediated the effects of IPV on RSS. Results: Respondents were 70% white and averaged 23 years. Sixty percent reported any RSS in the past three months, and 33% reported any IPV in the past year. In multivariate analysis, women reporting IPV

in the past year were marginally more likely to report RSS in the past three months compared to those who did not report IPV ( $p=0.05$ ). The association between IPV and RSS was independently mediated by self-esteem ( $p<0.01$ ) and depression ( $p<0.01$ ) but not self-efficacy for safer drug use ( $p>0.05$ ). Conclusions: Young female IDUs who experience IPV are at risk for bloodborne infections via RSS. This cross-sectional analysis suggests that IPV is associated with increased depression and reduced self-esteem, which are both associated with increased RSS. Future interventions targeting RSS should account for the effects of IPV on women's depression and self-esteem since our findings suggest that these factors may mediate the effects of IPV on injection-related risk. Interventions for those who perpetrate IPV should also be developed to protect women from the multiple health hazards of injection drug use.

#### **PARENTAL SEPARATION PREDICTS EARLY SUBSTANCE INVOLVEMENT IN CHILDREN OF ALCOHOLIC FEMALE TWINS**

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Using self-report data on 1225 male and female children of female alcoholic or control twins and their co-twin, we examine the hypothesis that parental separation predicts early substance involvement controlling for genetic and environmental risks associated with maternal alcohol use disorder (AUD). Analyses were conducted using Cox proportional hazards regression predicting age at first cigarette use, onset of regular smoking, first alcohol use, first alcohol intoxication, and first use of marijuana from parental divorce or never-marriage and maternal and co-twin AUD, with three dummy variables coding for offspring at high genetic risk and high environmental risk (Group 1: mother AUD+), high genetic risk but reduced environmental risk (Group 2: mother AUD-, MZ co-twin AUD+), intermediate genetic risk but reduced environmental risk (Group 3: mother AUD-, DZ co-twin AUD-), and low genetic and low environmental risk, i.e., offspring from control families. We observe significant associations between parental separation and first cigarette use (HR = 1.38, 95% CI: 1.10-1.72), onset of regular smoking (HR = 1.55, 95% CI: 1.11-2.17), first alcohol use (HR = 1.29, 95% CI: 1.07-1.55), alcohol intoxication by age 12 (HR = 2.42, 95% CI: 1.41-4.15), and first use of marijuana (HR = 1.53, 95% CI: 1.14-2.04). Adjusting for conduct problems and paternal alcoholism, parental separation remains a significant predictor of first alcohol use (HR = 1.23, 95% CI: 1.03-1.48) and alcohol intoxication by age 12 (HR = 2.13, 95% CI: 1.23-3.67). Together, these analyses underscore the importance of parental separation as a risk-factor for early substance involvement that remains predictive in the presence of statistical controls for parental alcoholism.

#### **SUBSTANCE USE, PSYCHOLOGICAL DISTRESS AND VIOLENCE AMONG PREGNANT AND BREASTFEEDING AUSTRALIAN WOMEN**

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Hypothesis: Women who use substances in pregnancy and while breastfeeding are at an increased risk of experiencing psychological distress and violence. Species: Human. Number of subjects: 976 pregnant and/or breastfeeding Australian women. Procedures: Data from the 2004 National Drug Strategy Household Survey, a survey of licit and illicit drug knowledge, attitudes and behaviour of 29,445 Australians were used to compare the prevalence of psychological distress and experience of violence among substance using and non-substance using pregnant and/or breastfeeding women. Results: Substance using pregnant and breastfeeding women were not at an increased risk of experiencing psychological distress or violence. Self-reported psychological distress was significantly more frequent in women of childbearing age (42%) than in pregnant and/or breastfeeding women, irrespective of substance use status (34% in substance users vs. 29% in non-substance users). Pregnant and breastfeeding women reported high levels of exposure to fear of violence by someone under the influence of alcohol irrespective of their use of substances (19% in substance users vs. 16% in non-substance users), and experience of verbal aggression (27% in substance users vs. 22% in the non-substance users); while 4% in each group reported physical assault. Pregnant and/or breastfeeding women were significantly less likely than women of childbearing age to consume alcohol (47% vs. 85%) or any illicit drug (6% vs. 17%). There was no significant difference in tobacco smoking (20% vs. 25%). Implications: A substantial proportion of Australian women of childbearing age experience psychological distress and are exposed to high levels of alcohol related violence, particularly verbal aggression. These findings highlight the importance of screening pregnant and breastfeeding women for substance use, psychological distress and violence, simplifying National pregnancy-specific alcohol guidelines and improving clinician training.

### **INTEGRATED INTERVENTION FOR ABUSED WOMEN IN DRUG TREATMENT: PRELIMINARY FINDINGS**

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Background. Up to 90% of women in substance abuse treatment report lifetime histories of intimate partner violence (IPV) victimization and/or perpetration, with more than half reporting IPV in the past year. Most research on IPV related to substance abuse has been limited to victimization focusing on alcohol as the abused substance; use of other drugs and women's concomitant roles as perpetrators of IPV have rarely been addressed. Purpose. To compare IPV victimization and perpetration (as measured by The Revised Conflicts Tactics Scale) of women participating in an integrated substance use disorder IPV cognitive behavioral therapy (SUD-IPV CBT) with women receiving in treatment as usual (TAU). Method. This SUD-IPV CBT was modified from Seeking Safety, a successful, established therapy originally designed for substance abuse and posttraumatic stress disorder. Modified treatment consisted of weekly 1.5 hour sessions over an 8-week period. Early pilot-testing conducted in a university-affiliated substance abuse treatment center with preliminary findings examined at completion of treatment and 3-months post treatment provided on 17 women exposed to the treatment compared with a convenience sample of 38 women receiving substance abuse TAU. Results. Women in the integrated SUD-IPV CBT group showed larger reductions in violence scores (victimization, perpetration, and overall score). The intervention had a greater impact on IPV perpetration than victimization ( $p=.09$ ) at the end of treatment, with slower declines at 3-month in most IPV categories (psychological, physical, & injury). Women in the SUD-IPV group completing at least 5 versus fewer (referred to as drop-out) sessions demonstrated the greatest improvement. Conclusions. Results from early pilot testing are favorable supporting continued testing with randomized controlled trial methods. Should these findings be confirmed in future research this treatment has potential to help substantial numbers of women affected by IPV. Funded by DA13955

### **GENDER DIFFERENCES IN PARAMETER-DEPENDENT TOLERANCE TO THE EFFECTS OF COCAINE IN A MODIFIED INTERVAL SCHEDULE OF REINFORCEMENT**

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Tolerance to the initial effects of cocaine can be modulated by schedules of reinforcement. In the case of ratio-maintained behavior, research has shown an inverse relationship between ratio requirement and amount of tolerance. However, tolerance in the presence of interval schedules generally developed regardless of requirement. The current experiment focused on differences between response requirement, and the relationship between response initiation and delay to reinforcement inherent to the two types of schedules. Differences in tolerance patterns between sexes were also evaluated. Tolerance is an important area of sex-related research due to reports revealing that cocaine-abusing women often take less time to meet dependence criteria and to enter treatment programs. Presented are data from 6 pigeons (3 male & 3 female) trained to respond to a three-component multiple schedule (tandem fixed-ratio 1 fixed-interval). The schedule began with an FR1 requirement and was followed by one of three FI values (5-, 15-, 60-s). Such schedules mimic the relation between initiation of responding and delay to reinforcement inherent to fixed-ratio schedules, while holding a constant response requirement. Acute administration of cocaine resulted in a dose-dependent decreases in responding. Chronic administration of a rate-decreasing dose resulted in tolerance patterns similar to those obtained with ratio schedules. Tolerance was assessed by ED50 measures and visual inspection. Results suggest that delay to reinforcement may play a role in the development of schedule-parameter-dependent tolerance. Conversely, response requirement may not play a strong role in schedule-dependent tolerance. Assessment of sex differences, via unpaired t-tests, revealed no significant differences between male and female ED50 values for the 3 schedule parameters, respectively tandem FR1FI 5-, 15-, & 60-sec ( $[t=1.86, df=5, p>.1]$ ,  $[t=2.22, df=5, p>.1]$ ,  $[t=1.39, df=5, p>.1]$ ) This finding suggests that behavioral and physiological aspects of tolerance are developed similarly across sexes.

### **SUBSTANCE ABUSE PROBLEM SEVERITY AMONG FEMALE DUI OFFENDERS AS A FUNCTION OF RURALITY**

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Background: Although there has been an overall decline in the rates of driving under the influence (DUI) during the past two decades, this decrease has not occurred uniformly across all groups of DUI offenders. For example, the proportion of female DUI offenders has increased over this time period, and DUI arrest rates remain higher in less populated areas of the country. Few studies, however, have focused on the growing population of female DUI offenders or have examined rural and urban differences in DUI offenders. The present study examines indicators of problem severity among female DUI offenders across graduated levels of rurality. Because rural areas have been considered to be a protective factor against drug and alcohol problems, it was hypothesized that rurality would be negatively associated with problem severity. Method: A total of 15,907 DUI assessment records from females convicted of DUI between 2002 - 2005 in Kentucky were examined. Beale codes were used to define the extent to which the county of conviction was rural (1= urban, 9= very rural). Data were analyzed using correlation and chi-

square analysis. Results: Rurality was consistently related to indicators of problem severity of the women in the sample. As predicted, rurality was inversely related to blood alcohol concentration ( $r = -.10$ ) and AUDIT scores ( $r = -.03$ ). Contrary to expectation, rurality was significantly and positively associated with multiple DUI offenses ( $\chi^2 = 16.56$ ), DAST scores ( $r = .20$ ), prevalence of DSM-IV substance dependence ( $\chi^2 = 262.89$ ) and abuse ( $\chi^2 = 55.04$ ) criteria, being referred to substance abuse treatment rather than an education program ( $\chi^2 = 46.19$ ), and referral noncompliance ( $\chi^2 = 55.04$ ). Implications: The study suggests that problem severity among female DUI offenders may be greater in rural areas, particularly with drug use. Practitioners, therefore, may face greater challenges in assessing and treating female DUI offenders from rural areas.

#### **ESTROUS CYCLE EFFECTS ON DARPP-32 ACTIVITY AFTER ACUTE COCAINE**

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An extensive body of literature provides evidence for sexual dimorphism in drug abuse pattern and behavioral activation. Female rats display a greater behavioral locomotor response, condition faster and at lower doses. Females also show greater hypothalamic-pituitary adrenal axis (HPA) activation and reward effects to cocaine. However, cellular mechanisms underlying the sexually dimorphic responses to cocaine remain unclear. Our hypothesis is that endogenous hormonal fluctuations during the estrous cycle modulate the DARPP-32 pathway after cocaine administration. To this end, male and female rats ( $n=4$ ) received a single injection of saline or cocaine (20 mg/kg), and were sacrificed 15 minutes following drug treatments. Brains regions of the NAc and CPu were dissected and later analyzed via Western blot for total DARPP-32 and phosphorylated (P-T34) DARPP-32. Overall, acute cocaine administration did not alter total DARPP-32 or P-T34 DARPP-32 protein levels. Moreover, no estrous cycle or sex differences in the protein levels of total DARPP-32 or P-T34 DARPP-32 were observed. This work was supported by PS-CUNY, RR-03037, NIDA DA 12136, SCORE 506-GM60654, 1454-NS41073, and SNRP NF 39534.

#### **PHARMACOKINETIC AND POSTNATAL EFFECTS FOLLOWING ACUTE METHAMPHETAMINE ADMINISTRATION IN FEMALE RATS DURING LATE-STAGE PREGNANCY**

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These studies determined the pharmacokinetics (PCKN) of (+)-methamphetamine (METH) and its metabolite, (+)-amphetamine (AMP), in female rats during late-stage pregnancy. Timed-pregnant Sprague-Dawley rats with indwelling jugular catheters received a single iv bolus dose of saline or METH (1, 3, or 5.6 mg/kg) on gestational day 21, 1 to 2 days prior to delivery. Blood samples were collected at predetermined times from 1-510 min after METH administration. METH and AMP serum concentrations were quantified by LC-MS/MS, followed by PCKN analyses of these data. After completion of the PCKN studies, the saline- and METH-treated rats were monitored to determine METH effects on time of delivery. From postnatal day 1 to 7, maternal and pup behaviors were observed, and litters were counted and weighed. PCKN analyses showed a linear dose-proportional increase in the area under the serum concentration-time curves for METH and for AMP following the three METH doses. The average value for METH half-life was 103, 116, and 138 min; for volume of distribution was 8, 7, and 8 L/kg; and for systemic clearance was 46, 43, and 38 ml/min/kg for the doses of 1, 3, and 5.6, respectively. The uniformity of PCKN values across the doses show that METH PCKN were independent of dose. This acute METH dose did not cause premature delivery in any of the dams, since all animals delivered on days 22-23. Postnatal behavior in dams and pups, and litter weight and size appeared unaffected by the prenatal METH exposure. These observational data indicate that a single acute dose of METH did not cause any apparent after birth effects in dams and pups. These studies represent an important step in our progression toward an understanding of acute and chronic effects of METH PCKN and animal health during pregnancy and after delivery. This research is supported by NIDA DA07610, NIEHS T32ES07310, and a GlaxoSmithKline graduate fellowship.

#### **GENDER DIFFERENCES IN SELF-REPORTED REASONS FOR COCAINE USE**

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Introduction: Previous work has identified gender differences in the development and expression of substance use disorders. Potential gender differences in individual reports of cocaine using situations are investigated here.

Methods: The Inventory of Drug Taking Situations (IDTS) is a 50-item self-report questionnaire that provides a profile of the situations in which an individual has used drugs over the past year. The IDTS includes 8 subscales of high-risk situations: unpleasant emotions, physical discomfort, pleasant emotions, testing personal control, urges and temptations, conflict with others, social pressure to use, and pleasant times with others. We included a total of 72 participants (62 men and 10 women) participating in one of 2 concurrent clinical trials for the treatment of

cocaine dependence. Gender differences were explored between the 8 subscales. Results: The mean age of the women in this study was 34 years (SE=3.27); 80% were Caucasian; mean number of days of cocaine use for the past 30 days prior to starting the study was 13 (SE=2.56). The mean age of the men was 39 years (SE=0.98); 52% were Caucasian; mean number of days of cocaine use for the past 30 days was 13 (SE=1.06). Women endorsed urges and temptations (women 72±14 vs men 59±17, p=0.027) and physical discomfort (women 40±22 vs men 25±20, p=0.048) significantly more often than men. In addition, women tended to endorse testing personal control more so than men (women 61±22 vs men 46±24, p=0.07). Further analysis revealed that the most significant item in the physical discomfort subscale was, "I used cocaine when I wanted to lose weight" (women 3±1 vs men 1±1, p<0.001). When this item was removed from the physical discomfort subscale, the gender difference was no longer significant (p=0.258). Conclusions: Gender differences in using cocaine may suggest that treatment options should be tailored to specifically meet women's needs. The report of the use of cocaine to lose weight in women is consistent with previous findings in nicotine research, in that fear of weight gain is a motivator for use and barrier to quitting.

#### **PRESCRIPTION DRUG MORTALITY AMONG OLDER WOMEN IN RURAL VIRGINIA**

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In epidemiological data, misuse, abuse, and death involving prescription drugs is a particular problem in rural areas. We test two hypotheses: 1) Prescription medication overdose is the cause of a disproportionate number of drug deaths in rural Western Virginia; 2) Older females 35-54 years old are at unexpectedly high risk but for different reasons than younger decedents. We report a retrospective review of all 309 Medical Examiner drug deaths (7/02-12/03) from Western Virginia extracting data from death scene, toxicology, and autopsy reports, field examiner reports, medical and hospital records and include socio-demographic information, evidence of drug use, abuse, or addiction, and medical history. As hypothesized, prescription medication deaths in rural Western Virginia are greater than in the U.S. as a whole (23.3/100K vs. 12.9 nationally for males, 11.8/100K vs. 7.0 for females, p<.001). Medications found frequently in these deaths included methadone, hydrocodone, fentanyl, oxycodone, alprazolam and diazepam. Females age 35-54 are at unexpectedly high risk of death from prescription drugs, but fewer had a history of substance abuse than did younger decedents. More women (71% of opioid cases and 72% of benzodiazepine cases) had prescriptions for the drugs identified in their deaths, including opioids, benzodiazepines, and antidepressants prescribed for chronic pain, depression, and anxiety. In many of these deaths inappropriate rather than illicit use of prescribed medications is implicated. Patients with diagnoses of chronic pain prescribed opioids, antidepressants, and/or benzodiazepines should be evaluated carefully for misuse of prescribed medications.

#### **EFFECTS OF BUPRENORPHINE, METHADONE, L-ACETYL METHADOLE AND THEIR METABOLITES ON PREGNENOLONE FORMATION BY HUMAN PLACENTA**

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Healthy pregnancy is dependent on placental biosynthesis of several hormones from maternal cholesterol including progesterone and estrogens. The formation of pregnenolone (Preg) from cholesterol is catalyzed by mitochondrial cytochrome P-450 side chain cleavage enzyme (SCC) and is the committed step in the biosynthesis of progesterone and estrogens in human placenta. However, SCC was also implicated in the biotransformation of administered medications. Moreover, the biotransformation of buprenorphine (BUP), L-acetylmethadole (LAAM) and methadone to their metabolites is catalyzed by placental microsomal CYP19/aromatase which is also known for its conversion of C19 androgens to C18 estrogens. Accordingly, a site for drug interactions was identified in women treated with BUP or methadone during pregnancy. Therefore, the aim of this investigation was to determine the effects of the above mentioned opiates on SCC. The conversion of cholesterol to Preg by placental mitochondrial fractions revealed typical Michaelis-Menten kinetics with an apparent Km of 20±7 µM and Vmax of 298 ± 32 pmole mgP-1 min-1. BUP and its metabolite norBUP had no effect on Preg formation. LAAM inhibited Preg formation with an IC50 of 516 ± 33 µM while its concentration of 1mM caused 90% inhibition. The IC50 values for the metabolites, norLAAM and dinorLAAM, were 609 ± 46 and 1098 ± 34 µM, respectively. However, only norLAAM (1mM) caused 90% inhibition. The IC50 for methadone was 706 ± 65 µM and its metabolite EDDP did not have an effect even at a concentration of 1mM. Reciprocal plots of the data on the effects of LAAM and methadone on the conversion of cholesterol revealed non-competitive type of inhibition. In conclusion, it is unlikely that therapeutic concentrations of BUP and LAAM will affect the formation of pregnenolone by placental SCC enzyme. Supported by a grant to MSA (DA-13431 from NIDA).

**SEX DIFFERENCES IN THE DEVELOPMENT OF COCAINE-INDUCED BEHAVIORAL SENSITIZATION AND TOLERANCE**

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Sex differences in behavioral response to cocaine administration have been reported; female rats are more sensitive to cocaine-induced locomotor behaviors than males. This study aimed to determine if female rats develop behavioral sensitization and tolerance to cocaine at a faster rate than males. To this end, male and female Fischer rats were randomly divided into three groups: saline, acute- and chronic-cocaine treatments. Saline groups received daily administration (i.p.) of saline. Acute-cocaine treated groups received saline administration throughout the experimental time course and the last day received a single cocaine treatment of 15 mg/kg. In the chronic-cocaine groups, rats received daily administration of cocaine (15 mg/kg) throughout 2, 5, or 14 days. Ambulatory, rearing and total locomotor activities were measured. Overall, cocaine increased locomotor behavior in both male and female rats. Female rats exhibited higher locomotor activities to cocaine when compared to males. In all three locomotor activities, female rats also developed sensitization to cocaine after 2 days of cocaine administration, while males developed sensitization in ambulatory and total locomotor activities after 5 days of cocaine administration. On the other hand, female rats developed tolerance to cocaine behavioral response after 14 days of cocaine administration, while males did not. Taken together, these data suggest that female rats are more sensitive in response to cocaine than male rats, since the rate of developing cocaine sensitization and tolerance is faster in females. This research was supported by SCORE 506-GM60654, MIDARP DA12136, SNRP NS-41073.



## Women and Sex/Gender Differences Funding Opportunity Announcements

- NOT-DA-07-006: Notice Regarding the Availability of Competitive Supplements to Study Sex/Gender Differences in Drug Abuse (<http://grants.nih.gov/grants/guide/notice-files/NOT-DA-07-006.html>), released Dec 15, 2006.
- PA-07-329: Women and Sex/Gender Differences in Drug and Alcohol Abuse/Dependence (R01), (<http://grants.nih.gov/grants/guide/pa-files/PA-07-329.html>), released Mar 15, 2007
- PA-07-330: Women and Sex/Gender Differences in Drug and Alcohol Abuse/Dependence (R03) (<http://grants.nih.gov/grants/guide/pa-files/PA-07-330.html>), released Mar 15, 2007.
- PA-07-331: Women and Sex/Gender Differences in Drug and Alcohol Abuse/Dependence (R21) (<http://grants.nih.gov/grants/guide/pa-files/PA-07-331.html>), released Mar 15, 2007.

For additional information:

- on these announcements, contact Dr. Cora Lee Wetherington ([wetherington@nih.gov](mailto:wetherington@nih.gov); 301-435-1319) or Dr. Samia Noursi ([snoursi@nih.gov](mailto:snoursi@nih.gov); 301-594-5622)
- on other 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>



## College on Problems of Drug Dependence Women & Gender Junior Investigator 2008 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 (NIDA) encourages the submission of abstracts on this topic for the 2008 annual meeting of the College on Problems of Drug Dependence (CPDD).

Special NIDA travel awards of up to \$750 will be available to 27 junior investigators whose CPDD abstract on women or sex/gender differences is accepted for either a poster or oral session at the 2008 annual meeting in San Juan, Puerto Rico, June 14-19, 2008.

### 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.

### NEW APPLICATION PROCEDURES FOR 2008 (ELECTRONIC SUBMISSION OF APPLICATIONS):

- Follow the CPDD instructions for abstract submission. Then send an e-mail to Dr. Samia Noursi at [snoursi@nida.nih.gov](mailto:snoursi@nida.nih.gov) in the following format and with the required attachments:
- E-mail Subject Line: 2008 CPDD Women & Gender Jr. Travel Awards Application
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- Your curriculum vitae (list all NIH grant support if applicable). Please include your institution/work address, telephone number and e-mail address.
- A cover letter stating (1) your eligibility, (2) your career goals, and (3) your interest in continuing to pursue research on women and/or sex/gender differences.

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For additional information about this annual award, contact:

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



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