

**COLLEGE ON PROBLEMS  
OF DRUG DEPENDENCE**

**June 17-22, 2006  
Scottsdale, Arizona**



*Mini-Program:*

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



**NIDA** NATIONAL INSTITUTE  
ON DRUG ABUSE

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

## PREFACE

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

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

To those of you who are junior investigators and engage in research in the area of women and gender differences, or are interested in pursuing research in this important area, NIDA will again sponsor the CPDD Women & Gender Junior Investigator Travel Awards for the 2007 CPDD meeting in Quebec City, Quebec, June 16-21, and we encourage you to apply (see the announcement on the last page).

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

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## CPDD 2006 WOMEN & GENDER JUNIOR INVESTIGATOR TRAVEL AWARDEES

**Lynn M. Anderson**

Virginia Commonwealth University

**Justin J. Anker**

University of Minnesota

**Shanna Babalonis**

University of Kentucky College of Medicine

**Vinita Batra**

Louisiana State University Health Sciences Center

**Jeffrey C. Batis**

Wayne State University

**Kipling Bohnert**

Michigan State University

**Wendy Beth Bostwick, Ph.D., MPH**

University of Michigan Substance Abuse Research Center

**Gregory Breeden, Ph.D., MPH**

University of Michigan

**Ya-Fen Chan, Ph.D., MHS, MSN**

Lighthouse Institute, Chestnut Health Systems

**Emma Childs, Ph.D.**

The University of Chicago

**Marc L. Copersino, Ph.D.**

McLean Hospital and Harvard Medical School

**Christine Coyne, Ph.D., RN**

University of Washington

**Matthew W. Feltenstein, Ph.D.**

Medical University of South Carolina

**Lesley L. Green, Ed.D.**

Columbia University

**Jennifer R. Havens, Ph.D., MPH**

University of Kentucky College of Medicine

**Deirtra A. Hunter**

The Graduate Center, City University of New York City

**Brian C. Kelly, Ph.D.**

City University of New York City

**Katherine Keyes**

New York State Psychiatric Institute

**Betha Kleykamp**

Virginia Commonwealth University

**Benjamin P. Kowal, Ph.D.**

University of Arkansas for Medical Sciences

**Joshua A. Lile, Ph.D.**

University of Kentucky College of Medicine

**Jennifer L. Newman, Ph.D.**

University of Minnesota

**Elizabeth Reynolds**

University of Maryland, College Park

**Deborah J. Rinehart**

University of Colorado at Denver and Health Sciences Center

**Allison V. Schlosser**

Washington University School of Medicine

**Wei-Lun Sun**

The Graduate Center, City University of New York City

**Yan Wang, M.D.**

Morgan State University

**Andrea H. Weinberger, Ph.D.**

Yale University School of Medicine

**Rinah Yamamoto, Ph.D.**

McLean Hospital

**CPDD 2006 WOMEN & GENDER  
JUNIOR INVESTIGATOR TRAVEL AWARDEES'  
RESEARCH PRESENTATIONS**

- Lynn M. Anderson**  
Virginia Commonwealth University
- Justin J. Anker**  
University of Minnesota
- Shanna Babalonis**  
University of Kentucky College of Medicine
- Jeffrey C. Batis**  
Wayne State University
- Vinita Batra**  
Louisiana State University Health Sciences Center
- Kipling Bohnert**  
Michigan State University
- Wendy Beth Bostwick, Ph.D., MPH**  
University of Michigan Substance Abuse Research Center
- Gregory Breeden, Ph.D., MPH**  
University of Michigan
- Ya-Fen Chan, Ph.D., MHS, MSN**  
Lighthouse Institute, Chestnut Health Systems
- Emma Childs, Ph.D.**  
The University of Chicago
- Marc L. Copersino, Ph.D.**  
McLean Hospital and Harvard Medical School
- Christine Coyne, Ph.D., RN**  
University of Washington
- Matthew W. Feltenstein, Ph.D.**  
Medical University of South Carolina
- Lesley L. Green, Ed.D.**  
Columbia University
- Tobacco use in a residential sample of drug dependent women (Page 16)
- Effects of progesterone and estrogen on the reinstatement of cocaine seeking behavior in female rats (Page 8)
- Estradiol modulation of the behavioral effects of d-amphetamine in premenopausal women (Page 17)
- Maternal blood and organ toluene levels after acute and repeated binge exposures (Page 15)
- Chronic exposure to analgesic doses of oxycodone does not alter female reproductive function in rats (Page 15)
- Male-female contrasts and other variations in 'exposure opportunity' and actual extra-medical use of analgesics in an epidemiological study (Page 23)
- Drug use and the DAST-10: Differences among collegiate sexual minority women (Page 8)
- Determinants of racial discrimination in adulthood and its relation to frequency of cocaine and marijuana drug use (Page 7)
- Gender differences in psychiatric multimorbidity among adolescent substance users admitted to treatment (Page 23)
- Physiological, subjective and hormonal responses to acute psychological stress: effects of sex and smoking status (Page 21)
- Gender differences in the experience of spontaneous cannabis quitting (Page 7)
- Women's alcohol craving and symptoms in early recovery (Page 22)
- Estrous cycle and hormonal influences on cocaine-primed reinstatement of drug seeking in female rats (Page 26)
- Prevalence and relationship of overweight and obesity among men and women in a long term residential substance abuse treatment program (Page 14)

**CPDD 2006 WOMEN & GENDER  
JUNIOR INVESTIGATOR TRAVEL AWARDEES'  
RESEARCH PRESENTATIONS**

- Jennifer R. Havens, Ph.D., MPH**  
University of Kentucky College of Medicine  
Prevalence and correlates of substance use during pregnancy: results from a national sample (Page 16)
- Deitra A. Hunter**  
The Graduate Center, City University of New York City  
Estrogen's effects on inflammatory induced pain are in part mediated through activation of cyclooxygenase (COX) biosynthesis of prostaglandin E2 (Page 21)
- Brian C. Kelly, Ph.D.**  
City University of New York City  
Gender differences in club drug use among young adults (Page 8)
- Katherine Keyes**  
New York State Psychiatric Institute  
Gender differences in the effect of birth cohort on risk for alcohol and drug dependence (Page 20)
- Betha Kleykamp**  
Virginia Commonwealth University  
What are the specific cognitive effects of transdermal nicotine and smoking, and do they depend on smoker's gender? (Page 21)
- Benjamin P. Kowal, Ph.D.**  
University of Arkansas for Medical Sciences  
Gender differences in temporal discounting may explain patterns of drug abuse (Page 20)
- Joshua A. Lile, Ph.D.**  
University of Kentucky College of Medicine  
Estradiol enhances the discriminative-stimulus and self-reported effects of d-amphetamine in healthy pre-menopausal women (Page 26)
- Jennifer L. Newman, Ph.D.**  
University of Minnesota  
Menstrual cycle phase modulates phencyclidine (PCP) self-administration in monkeys (Page 21)
- Elizabeth Reynolds**  
University of Maryland, College Park  
Toward a better understanding of the relationship between gender and crack/cocaine use (Page 26)
- Deborah J. Rinehart**  
University of Colorado at Denver and Health Sciences Center  
Gender differences between out-of-treatment injectors (Page 9)
- Allison V. Schlosser**  
Washington University School of Medicine  
Gender differences in improvement in readiness to change crack cocaine use: comparing peer-enhanced versus standard HIV prevention interventions (Page 9)
- Wei-Lun Sun**  
The Graduate Center, City University of New York City  
Progesterone blocks acquisition and expression of cocaine-reward through blocking memory formation (Page 26)
- Yan Wang, M.D.**  
Morgan State University  
Gender differences in the efficacy of intervention trials on preventing tobacco smoking among children and adolescents (Page 18)
- Andrea H. Weinberger, Ph.D.**  
Yale University School of Medicine  
Gender differences in smoking expectancies and the relationship of expectancies to amount of smoking (Page 18)
- Rinah Yamamoto, Ph.D.**  
McLean Hospital  
Flutamide reduces benzoylecgonine levels following cocaine infusion in men (Page 21)

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**Sunday, June 18, 2006**

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**POSTER SESSION I (Lunch)**

**Pavilion**

**11:00 AM - 1:00 PM**

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

**Set up time begins Saturday 2:00 P.M.**

**Must be removed by Sunday 1:30 P.M.**

**MARIJUANA/CANNABINOIDS**

- 9 *Gender differences in the experience of spontaneous cannabis quitting*  
M. L. Copersino(1,2), S. J. Boyd(2), D. P. Tashkin(3), M. A. Huestis(2),  
S. J. Heishman(2), J. C. Dermand(3), M. S. Simmons(3) and D. A.  
Gorelick(2), (1) McLean Hospital/Harvard Medical School, Belmont, MA, (2)  
NIH/NIDA Intramural Research Program, Baltimore, MD and (3) David  
Geffen School of Medicine, UCLA, Los Angeles, CA
- 14 *Determinants of racial discrimination in adulthood and its relation to frequency  
of cocaine and marijuana drug use*  
G. Breeden and M.E. Ensminger, Center for Research on Ethnicity, University  
of Michigan, Ann Arbor, MI and Johns Hopkins Bloomberg School of Public  
Health, Baltimore, MD
- 15 *Marijuana arrests: Influences of ethnicity, gender, blunts vs. joints, and  
marijuana etiquette*  
G. Ream, B. D. Johnson, A. Golub and E. Dunlap, Special Populations  
Research, National Development and Research Institutes, New York, NY
- 18 *Predictors of marijuana use among married couples: The influence of one's  
spouse*  
G. G. Homish(1), K. E. Leonard(1,2) and J. R. Cornelius(3), (1) Research  
Institute on Addictions, and (2) Department of Psychiatry, University at  
Buffalo, The State University of New York, Buffalo, NY and (3) University  
of Pittsburgh, Pittsburgh, PA

**PSYCHIATRIC COMORBIDITY I**

- 26 *Major depression: Contributions of gender, MDMA and cannabis use*  
H. Durdle, L. H. Lundahl, C. E. Johanson and M. E. Tancer, Wayne State  
University School of Medicine, Detroit, MI
- 29 *Traumatic events, PTSD, and gender differences over time in syringe-exchange  
participants*  
J. Peirce, C. K. Burke, M. S. Kidorf and R. K. Brooner, Johns Hopkins  
University School of Medicine, Baltimore, MD
- 35 *Treatment for PTSD and SUD: Site differences and implications for outcomes*  
D. Hien(1) and E. V. Nunes(2), (1) School of Social Work, Columbia  
University, (2) New York State Psychiatric Institute, Columbia University,  
New York, NY



**NICOTINE: ANIMAL STUDIES**

- 44 *The effects of nicotine conditioned place preference in D2-primed adolescent rats: Age-related and gender effects*  
C. L. Bruner, E. L. Cooper, M. K. Perna, C. Estep, K. N. Thompson and R. W. Brown, East Tennessee State University, Johnson City, TN

**CLUB DRUGS**

- 62 *Health status and symptoms among young female ecstasy and other drug users*  
H. Wu, C. Holzer, J. Grady and A. Berenson, University of Texas Medical Branch, Galveston, TX
- 63 *Gender differences in club drug use among young adults*  
B. C. Kelly(1,2) and J. T. Parsons(1,3,4), (1) Center for HIV Educational Studies & Training, City University of New York, (2) Columbia University, (3) Hunter College, and (4) Department of Psychology, Graduate Center, CUNY, New York, NY
- 64 *Gender differences in risk for forced sexual contact among club drug users*  
C. L. Striley(1), J. Copeland(2), J. Inciardi(3) and L. Cottler(1), (1) Washington University School of Medicine, St. Louis, MO, (2) University of New South Wales, Sydney, New South Wales, Australia and (3) University of Delaware, Coral Gables, FL
- 67 *Selective impairments of executive function in young, female MDMA ("Ecstasy") users: Effects that are not attributable to concomitant cannabis use*  
P. Terry and C. O'Brien, School of Psychology, University of Birmingham, Birmingham, UK

**COCAINE AND AMPHETAMINE: MECHANISMS AND BEHAVIOR**

- 95 *Effects of progesterone and estrogen on reinstatement of cocaine-seeking behavior in female rats*  
J.J. Anker, E.B. Larson and M.E. Carroll, University of Minnesota, Minneapolis, MN
- 96 *Reinstatement of cocaine-seeking behavior in rats selected for high or low impulsivity or saccharin intake: Sex differences*  
J. L. Perry, S. E. Nelson, J. J. Anker and M. E. Carroll, University of Minnesota, Minneapolis, MN

**POLYDRUG ABUSE I**

- 119 *Drug use and the DAST-10: Differences among collegiate sexual minority women*  
W.B. Bostwick(1), S. McCabe(1), M. Grey(3), J. Cranford(1) and C. Boyd(2), (1) Substance Abuse Research Center, and (2) Institute for Research on Women and Gender, University of Michigan, Ann Arbor, and (3) Eastern Michigan University, Ypsilanti, MI

- 123 *Predictors of youth substance use in substance-abusing families*  
M. E. Burstein(1), C. Stanger(2) and J. Kamon(1), (1) University of Vermont, Burlington, VT and (2) University of Arkansas for Medical Sciences, Little Rock, AR
- 126 *Service needs, utilization, and outcomes of women in women-only and mixed-gender drug abuse treatment programs*  
N. Niv and Y. I. Hser, Integrated Substance Abuse Programs, UCLA, Los Angeles, CA

**OPIATES: TREATMENT I**

- 140 *Clinical correlates of accelerated aging: Multiple stem cell lineage depression in addiction*  
M. Missenden and A. S. Reece, General Practice, Southcity Medical Centre, Brisbane, Queensland, Australia
- 141 *Risk for opioid abuse/dependence in non-medical prescription opioid users: Evaluating the role of gender*  
R. Desai, L. Sullivan, W. Becker, J. Tetrault and D. Fiellin, Yale University, New Haven, CT

**HIV/AIDS I**

- 159 *Gender differences between out-of-treatment injectors*  
D. Rinehart, C. F. Kwiatkowski, K. F. Corsi and R. E. Booth, University of Colorado at Denver and Health Sciences, Denver, CO
- 161 *Gender differences in rates of positive urine drug tests for opiate, cocaine, and marijuana use among South African drug users*  
A. Moleko(2), W. W. Latimer(1), J. Towers(1), C. Maroga(2), F. Mantlwa(2) and S. Molonyane(2), (1) Johns Hopkins Bloomberg School of Public Health, Baltimore, MD and (2) University of Pretoria, Pretoria, South Africa
- 167 *Gender differences in improvement in readiness to change crack cocaine use: Comparing peerenhanced versus standard HIV prevention interventions*  
A. V. Schlosser, S. Bradford, C. Callahan and L. Cottler, Washington University School of Medicine, St. Louis, MO

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**Sunday, June 18, 2006**

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**Oral Communications 4**

**Salons FG  
3:30 - 5:30 PM**

**IN SEARCH OF RELIEF: CHRONIC PAIN**

Chairs: Leslie Amass and Deborah L. Haller

- 3:45 *Risk factors associated with abuse of prescription opioids: Results of a national survey*  
J. Tetrault, R. Desai, W. Becker, D. Fiellin, J. Concato and L. Sullivan, Yale University, New Haven, CT

**Oral Communications 5**

**Salons DE  
3:30 - 5:30 PM**

**SMOKING: BENCH TO BEDSIDE**

Chairs: Ian Stolerman and Susan Robinson

- 5:15 *Smoking outcome expectancies predict nicotine withdrawal symptoms in mildly and moderately depressed college women smokers*  
A. Copeland(1) and G. S. Hecht(2), (1) Louisiana State University, and (2) Southern University, Baton Rouge, LA

**Oral Communications 6**

**Salons ABC  
3:30 - 5:30 PM**

**PRECLINICAL STUDIES OF EARLY DRUG EXPOSURE**

Chairs: Katherine L. Nicholson and Laura E. O'Dell

- 3:45 *Prenatal opiate exposure followed by postnatal withdrawal enhances the corticosterone response to cocaine in adult rats*  
L. Schrott and L. M. Franklin, LSU Health Sciences Center, Shreveport, LA

**Workshop V**

**Salons FG  
8:00 - 10:00 PM**

**HIV/AIDS RESEARCH IN THE NIDA CLINICAL TRIALS NETWORK: EMERGING RESULTS**

Chair: James L. Sorensen

- HIV/STD safer sex skills groups for women: Preliminary results*  
Susan Tross, New York State Psychiatric Institute, New York, NY

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**Monday, June 19, 2006**

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**POSTER SESSION II (Lunch)**

**Pavillion**

**11:00 AM – 1:00 PM**

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

**Set up time begins Sunday 2:00 P.M.  
Must be removed by Monday 1:30 P.M.**

**COCAINE, AMPHETAMINES: HUMAN STUDIES I**

57 *Daily stressor sensitivity, abuse effects, and cocaine use in cocaine dependence: Gender differences*

A. E. Waldrop, S. E. Back, K. T. Brady, H. P. Upadhyaya, A. L. McRae and M. E. Saladin, CNS Division, Medical University of South Carolina, Charleston, SC

**GENES AND PROTEINS**

76 *Genetic influences on the relative reinforcing value of nicotine*

R. Ray(1), C. Lerman(2), C. Jepsen(2), F. Patterson(2), A. Strasser(2), M. Rukstalis(2), K. Perkins(3), K. Lynch(2), S. O'Malley(4) and W. Berrettini(2), (1) Dept. of Pharmacology, and (2) Dept. of Psychiatry, U. of Pennsylvania, Philadelphia, (3) U. of Pittsburgh School of Medicine, Pittsburgh, PA and (4) Yale School of Medicine, New Haven, CT

84 *Gender differences in association of the hPer2 gene polymorphisms with cocaine dependence*

V. Yuferov, D. Hua, S.C. Hamon, J. Ott, M.J. Kreek, Rockefeller University, New York, NY

85 *Contrasting genetic models for lifetime comorbidity of cannabis and OI D use and problem use in Australian adult twins*

A. Agrawal, M. Lynskey, M. Neale, K. Bucholz, N. Martin, P. Madden and A. Heath, Washington University School Medicine, St. Louis, MO, Virginia Commonwealth University, Richmond, VA and QIMR, Brisbane, Queensland, Australia

**OPIATES: TREATMENT II**

111 *The importance of early progress in treatment for female substance abusers*

J. Y. Sacks, National Development and Research Institutes, New York, NY

112 *Relationship between intimate partner violence and health status among drug-dependent women in drug treatment*

B. Walton-Moss and M. McCaul, Johns Hopkins University, Ellicott City, MD

**PSYCHIATRIC COMORBIDITY II**

- 135 *A longitudinal investigation of intimate partner violence among mothers with co-occurring mental illness and substance abuse disorders*  
M. D. McPherson, UMSARC, University of Michigan, Ann Arbor, MI

**CRIMINAL JUSTICE**

- 147 *Predictors of return-to-prison following community treatment for substance-abusing female offenders*  
C. Grella and L. Greenwell, Integrated Substance Abuse Programs, UCLA, Los Angeles, CA
- 148 *Gender differences in treatment engagement among a sample of incarcerated substance abusers*  
M. Staton-Tindall(1), B. Garner(2), J. Morey(2), C. Leukefeld(1), C. Saum(3), C. Oser(1) and M. Webster(1), (1) University of Kentucky, Lexington, KY, (2) TCU, Fort Worth, TX and (3) University of Delaware, Newark, DE
- 152 *Attachment and social support among women drug offenders in community treatment*  
E. A. Hall and M. L. Prendergast, University of California, Los Angeles, CA
- 153 *Deconstructing HIV prevention interventions among drug abusing female offenders: Preliminary results of long-term follow-up efforts*  
C. F. Vemulapalli, C. Callahan, A. Ben Abdallah and L. B. Cottler, Washington University School of Medicine, St. Louis, MO
- 154 *Arrest history as a critical indicator of risk among cocaine-using women*  
C. Callahan, A. Ben Abdallah and L. Cottler, Washington University School of Medicine, St. Louis, MO

**POLICY**

- 166 *Disclosure of sensitive information in non-treatment-seeking post-partum women: A randomized trial of four approaches to participant protection*  
S. K. Chase and S. J. Ondersma, Wayne State University, Detroit, MI

**LITERATURE REVIEW**

- 177 *Menstrual cycle phase effects on nicotine withdrawal and cigarette craving: A review*  
C. E. Horne, M. J. Carpenter, H. P. Upadhyaya, S. LaRowe, M. Saladin and K. T. Brady, Medical University of South Carolina, Charleston, SC

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**Monday, June 19, 2006**

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**Oral Communications 10**

**Salons ABC  
3:30 - 5:30 PM**

**PROGRESS IN BUPRENORPHINE TREATMENT**

Chairs: Stephen Magura and George E. Woody

3:30 *Transferring from high doses of methadone to buprenorphine: A randomised trial of three different buprenorphine schedules*

N. Clark(1,2,3), N. Lintzeris(5), D. Jolley(4), G. Whelan(3), J. Bell(6), A. Ritter(1) and A. Dunlop(1), (1) Turning Point Alcohol & Drug Centre, (2) Addiction Medicine Unit, Southern Health, (3) Department of Medicine, U. of Melbourne, and (4) Services Research, Monash U., Melbourne, Victoria, Australia; and (5) National Addiction Centre, London, UK



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**Tuesday, June 20, 2006**

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**POSTER SESSION III (Lunch)**

**Pavillion  
12:30 – 2:30 PM**

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

**Set up time begins Monday 1:30 P.M.  
Must be removed by Tuesday 3:00 P.M.**

**POLYDRUG ABUSE II**

- 10 *Prevalence and relationship of overweight and obesity among men and women in a long-term residential substance abuse treatment program*  
L. L. Green(1), T. Horton(2), A. Phillips(2), F. Levin(1) and R. Fullilove(1),  
(1) Columbia University, and (2) Phoenix House, New York, NY
- 11 *Individual and social factors associated with drug treatment participation*  
V. A. Gyarmathy(1,2) and C. A. Latkin(3), (1) Department of Mental Health,  
Johns Hopkins Bloomberg School of Public Health, Baltimore, MD, (2)  
National Development and Research Institutes, Inc., New York, NY and (3)  
Department of Health, Behavior & Society, Johns Hopkins Bloomberg School  
of Public Health, Baltimore, MD
- 13 *Impact of behavioral incentives on residential treatment attendance in drug-dependent women*  
D. Svikis, D. Langhorst, S. Meshberg-Cohen, T. Vance, A. Alvanzo and L.  
Anderson, Virginia Commonwealth University, Richmond, VA

**TREATMENT**

- 24 *Healthy Lifestyles: A psycho-educational group program for women with substance use disorders*  
A. Mhaskar, D. L. Miller, A. H. Skinstad and M. Orwa, University of Iowa,  
College of Public Health, Iowa City, IA

**HIV/AIDS II**

- 34 *The context of drug and alcohol use among sex workers in Pretoria, South Africa*  
W. M. Wechsberg, W. K. Luseno, R. S. Karg and E. Costenbader,  
RTI International, Research Triangle Park, NC
- 35 *Rapid assessment of drug use and sexual HIV risk patterns in vulnerable populations in Durban, Pretoria and Cape Town, South Africa*  
C. D. Parry(1), A. Pluddemann(1), A. Achrekar(2), M. Pule(1), F. Koopman(1),  
T. Williams(2) and R. Needle(2), (1) Alcohol & Drug Abuse, Medical Research  
Council, Cape Town, South Africa and (2) Centers for Disease Control &  
Prevention, Atlanta, GA

- 36 *Rates of HIV disease among South African drug users: An evaluation of gender and drug use type as HIV risk factors*  
W. W. Latimer(1), A. G. Moleko(2), D. Alama(1), C. Maroga(2), F. Mantlwa(2), S. Molonyane(2) and A. Melnikov(1), (1) Johns Hopkins Bloomberg School of Public Health, Baltimore, MD and (2) University of Pretoria, Pretoria, South Africa
- 37 *Gender differences in sex trade behavior and injection drug use among South African drug users*  
D. Asante, S. G. Severtson, J. Nuni, C. Salama, C. Maroga, S. Molonyane, F. Mantlwa, A. Moleko and W.W. Latime, Johns Hopkins Bloomberg School of Public Health, Baltimore, MD and University of Pretoria, Pretoria, South Africa
- 40 *Behavioral functions of sexual behavior across regular, casual, and commercial partners among urban drug users with a history of childhood victimization: Gender and context*  
M.A. Bornovalova, M. Nock, K. Belendiuk and C.W. Lejuez, University of Maryland, College Park, MD and Harvard University, Cambridge, MA
- 41 *Sex (trading) in the city: Practices and beliefs among female crack/cocaine sex traders*  
L. B. Cottler, A. Ben Abdallah and C. Callahan, Washington University School of Medicine, St. Louis, MO

**PRESCRIPTION DRUG ABUSE**

- 56 *Characterization of individuals who abuse prescription opioid analgesics or heroin*  
T. J. Cicero(1), J. A. Inciardi(2) and A. Munoz(3), (1) Washington University, St. Louis, MO, (2) University of Delaware, Coral Gables, FL and (3) The Johns Hopkins University School of Public Health, Baltimore, MD

**PERINATAL DRUG EXPOSURE**

- 61 *Maternal blood and organ toluene levels after acute and repeated binge exposures*  
J. Batis, S. Irtenkauf, J. Hannigan and S. Bowen, Wayne State University, Detroit, MI
- 62 *Effects of chronic methamphetamine use in the pregnant rat and her litter*  
S. J. White, E. M. Laurenzana and S. M. Owens, University of Arkansas for Medical Sciences, Little Rock, AR
- 64 *Chronic exposure to analgesic doses of oxycodone does not alter female reproductive function in rats*  
V. Batra, L.M. Franklin and L. Schrott, LSU Health Sciences Center, Shreveport, LA



- 65 *Early smoking status predicts smoking-cessation outcomes in pregnant women*  
S. Higgins(1,2), S. H. Heil(1,2), L. J. Solomon(2), I. M. Bernstein(3), A. M. Dumeer(1) and C. S. Thomas(4), (1) Department of Psychiatry, (2) Department of Psychology, (3) Department of Obstetrics & Gynecology, and (4) Department of Biostatistics, University of Vermont, Burlington, VT
- 66 *The influence of cigarette smoking in opioid-maintained pregnant women*  
B. Winklbaur(1), N. Ebner(1), C. Nagy(2), K. Thau(1) and G. Fischer(1), (1) Medical University of Vienna, and (2) University of Vienna, Vienna, Austria
- 67 *Delay discounting predicts postpartum relapse to cigarette smoking among pregnant women*  
J. H. Yoon(1), S. T. Higgins(1,2), S. H. Heil(1,2), C. S. Thomas(3) and R. J. Sugarbaker(1), (1) Department of Psychiatry, (2) Department of Psychology, and (3) Department of Biostatistics, University of Vermont, Burlington, VT
- 68 *Tobacco use in a residential sample of drug-dependent women*  
L. M. Anderson, D. Svikis, D. Langhorst and S. Meshburg-Cohen, Virginia Commonwealth University, Richmond, VA
- 69 *Weight gain following smoking cessation among female prisoners*  
K. Cropsey(1), S. Ceperich(2), M. Weaver(1), G. Villalobos(1) and M. Stitzer(3), (1) Virginia Commonwealth University, Richmond, VA, (2) University of Virginia, Charlottesville, VA and (3) Johns Hopkins University, Baltimore, MD
- 71 *Reinforcement-based Treatment is an effective treatment for drug dependence during pregnancy*  
M. Tuten and H. E. Jones, School of Medicine, Johns Hopkins University, Baltimore, MD
- 72 *Leveraging technology: Evaluation of a computer-based brief intervention for postpartum drug use and a dynamic predictor of treatment response*  
S. J. Ondersma(1), D. S. Svikis(2) and C. R. Schuster(1), (1) Wayne State University, Detroit, MI and (2) Virginia Commonwealth University, Richmond, VA
- 73 *Association between drug abuse and spontaneous or threatened miscarriage in psychiatrically ill women*  
K. Peindl(1), P. Mannelli(1), T. Lee(1), C. Kuhn(1), M. Narasimhan(2), R. Hubbard(1), K. Hill(3) and A. Patkar(1), (1) Duke University, Durham, NC (2) University of South Carolina, Columbia, SC and (3) Yale University, New Haven, CT
- 74 *Prevalence and correlates of substance use during pregnancy: Results from a national sample*  
J. R. Havens(1), L. A. Simmons(2), W. F. Hansen(3) and C. G. Leukefeld(1), (1) Center on Drug and Alcohol Research, (2) Department of Family Studies, and (3) Department of Obstetrics and Gynecology, University of Kentucky, Lexington, KY

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**Tuesday, June 20, 2006**

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- 75 *Childhood abuse, substance use disorder, and pregnancy problems in young adult women*  
A. C. Mezzich, M. Swaney, J. Heliste and B. Day, University of Pittsburgh, Pittsburgh, PA
- 76 *Factors associated with health status—10-year follow-up of prenatal cocaine/polydrug use*  
S. Minnes, L. Singer and S. Satayatham, Case Western Reserve University, Cleveland, OH
- 80 *Cocaine decreases progesterone synthesis in placental cells and elevates prostaglandin levels in the amniotic fluid during pregnancy in humans*  
B. Ahluwalia, Howard University, Washington, DC
- 81 *Methadone concentrations in breast milk and blood and associated neonatal neurobehavior*  
L. M. Jansson(1), R. Choo(2), M. Velez(1), C. Harrow(3), J. Schroeder(4) and M. Huestis(2), (1) The Johns Hopkins University School of Medicine, (2) NIH/NIDA/Intramural Research Program, (3) Johns Hopkins Bayview Medical Center and (4) Office of the Clinical Director, NIH/NIDA/Intramural Research Program, Baltimore, MD

**COCAINE, AMPHETAMINES: HUMAN STUDIES II**

- 84 *Crack-using African-American moms: Is parenting a barrier to seeking treatment?*  
W. K. Lam, W. M. Wechsberg, R. S. Karg, W. A. Zule, R. G. Bobashev and R. Middlesteadt-Ellerson, RTI International, Research Triangle Park, NC
- 87 *Sexual and physical abuse in childhood and victimization in adulthood among substance-using women*  
K. Vaddiparti, A. Ben Abdallah, C. Callahan and L. B. Cottler, Washington University School of Medicine, St. Louis, MO
- 90 *Brazilian female crack users show high serum aluminum levels*  
F. Pechansky(1), F. Kessler(1), L. V. Diemen(1), D. Bumaguin(1), H. Surratt(2) and J. A. Inciardi(2), (1) Center for Drug and Alcohol Research, UFRGS, Porto Alegre, RS, Brazil and (2) Center for Drug and Alcohol Studies, Coral Gables, FL
- 99 *Estradiol modulation of the behavioral effects of d-amphetamine in premenopausal women*  
S. Babalonis, J.A. Lile, C.S. Emurian, S.L. Kendall, C.A. Martin and T.H. Kelly, University of Kentucky, Lexington, KY

**COCAINE, AMPHETAMINES: MECHANISMS AND BEHAVIOR II**

- 116 *Maternal separation causes changes in cocaine self-administration in dams and treated pups as adults*  
M. Moffett(1), J. Harley(1), D. Francis(3), S. Sanghani(2), W. Davis(2) and M. Kuhar(1), (1) Emory University, Atlanta, GA, (2) Indiana University

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**Tuesday, June 20, 2006**

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School of Medicine, Indianapolis, IN and (3) University of California  
Berkeley, Berkeley, CA

**ADOLESCENT DRUG ABUSE I**

- 119 *Disruption of the neuronal nitric oxide synthase gene prevents neuroadaptations involved in the maintenance and reinstatement of cocaine conditioned place preference in adolescent mice*  
M.A. Balda, K.L. Anderson and Y. Itzhak, University of Miami School of Medicine, Miami, FL
- 121 *Early adolescent THC alters behavior in avoidance paradigms in sex-specific ways*  
D. Dow-Edwards, N. Zhao and S. Stephenson, State University of New York-Downstate, Brooklyn, NY
- 122 *High-risk drinking, substance use, and risk behavior among college students: A preliminary investigation*  
K. Ragsdale(1), C. Gore-Felton(2) and E. McGarvey(3), (1) National Development and Research Institutes, New York, NY (2) Stanford University, Stanford, CA and (3) University of Virginia, Charlottesville, VA
- 130 *Menstrual symptomatology and cigarette smoking in adolescent girls: Preliminary findings*  
M. Jaszyna-Gasior, F. H. Franken, M. K. Leff, K. S. Bagot, E. J. Luther, M. B. Royo, C. C. Collins, E. D. Thorner and E. T. Moolchan, Teen Tobacco Addiction Research Clinic and, DHHS, NIH/NIDA/Intramural Research Program, Baltimore, MD
- 131 *Gender differences in smoking expectancies and the relationship of expectancies to amount of smoking*  
A. H. Weinberger(1,2), E. Reutenauer(1), J. C. Vessicchio(1) and T. P. George(1), (1) Yale University School of Medicine, New Haven, CT and (2) VISN1/MIRECC, West Haven VA, West Haven, CT
- 132 *Marijuana use and tobacco smoking trajectory: Associated ethnic and gender differences among adolescent smokers*  
E. T. Moolchan, F. H. Franken, C. C. Collins, E. J. Luther, S. J. Heishman, D. H. Epstein and M. Jaszyna-Gasior, NIH/NIDA/Intramural Research Program, Baltimore, MD
- 133 *Gender differences in the efficacy of intervention trials on preventing tobacco smoking among children and adolescents*  
Y. Wang(1), N. Ialongo(2), F. A. Wagner(1), S. F. Lambert(3), C. L. Storr(2) and D. C. Browne(1), (1) Morgan State University, and, (2) Johns Hopkins University, Baltimore, MD and (3) George Washington University, Washington, DC
- 140 *Spirituality and its relationship to substance use and comorbid conditions in an ethnically diverse adolescent treatment population*  
J. C. Titus and M. L. Dennis, Chestnut Health Systems, Bloomington, IL

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**Tuesday, June 20, 2006**

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**PROGRAM DESCRIPTION**

- 149 *Risky business: Sexual behaviors, drug use and violence among sex-trading women in St. Louis*  
T. A. Millay, C. Callahan and L. Cottler, Washington University School of Medicine, St. Louis, MO
- 150 *Challenges of recruiting high-risk drug-using women for a HIV vaccine trial*  
H. Navaline, J. Becher, M. Lanier, T. Brown, R. White, G. Woody and D. Metzger, University of Pennsylvania, Philadelphia, PA
- 151 *Selectively willing: Attractions and barriers to HIV vaccine research participation among crack-cocaine-using women in Philadelphia*  
C. D. Voytek, K. T. Jones, T. Brown, R. White, A. Fleck, G. E. Woody and D. S. Metzger, School of Medicine, University of Pennsylvania, Philadelphia, PA
- 168 *Hand-in-Hand Program: A psycho-educational group program for women with substance use and co-occurring mental health disorders*  
D. L. Miller, A. H. Skinstad and A. Mhaskar, University of Iowa, College of Public Health, Iowa City, IA

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**Wednesday, June 21, 2006**

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**POSTER SESSION IV (Lunch)**

**Pavillion  
11:00 AM – 1:00 PM**

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

**Set up time begins Tuesday 3:30 P.M.  
Must be removed by Wednesday 1:30 P.M.**

**SEX DIFFERENCES**

- 1 *Gender differences in temporal discounting may explain patterns of drug abuse*  
B. P. Kowal, K. M. Gatchalian, R. Yi and W. K. Bickel, University of Arkansas for Medical Sciences, Little Rock, AR
- 2 *Gender differences in the pattern and predictors of the cycle of relapse, treatment re-entry and recovery*  
C. K. Scott(1), M. A. Foss(1), C. Grella(1,2) and M. L. Dennis(1), (1) Chestnut Health Systems, Chicago and Bloomington, IL and (2) University of California, Los Angeles, CA
- 3 *A gender perspective on violent behaviors in cocaine addicts*  
J. Gomez(1), S. Tortajada(1), E. Clari(1), A. Saiz(1), J. C. Valderrama(1), I. Serra(1), J. Guillot(2), J. C. Perez de los Cobos(3) and P. Needle(4), (1) Instituto de Historia de la Ciencia y Documentacion, and (2) Unidad de Conductas Adictivas de Moncada, Valencia, Spain, (3) Hospital Sant Pau, Barcelona, Spain and (4) Consultant to NIDA, Atlanta, GA
- 4 *Gender differences in sexual risk behaviors and seropositivity among young non-injection heroin users*  
R. R. Robles, T. D. Matos, H. M. Colon, J. C. Reyes, J. Calderon and J. Negron, Universidad Central del Caribe, Bayamon, Puerto Rico
- 5 *Gender differences in the effect of birth cohort on risk for alcohol and drug dependence*  
K. Keyes and D. S. Hasin, New York State Psychiatric Institute, New York, NY
- 6 *Male-female difference in risk of rapid transition to dependence among recent onset tobacco and alcohol users in Peru*  
M. J. Piazza(1,2) and G. F. Alvarado(1,3), (1) Universidad Peruana Cayetano Heredia, and (2) Belgian Technical Cooperation, Lima, Peru and (3) Epidemiology, Michigan State University, East Lansing, MI
- 7 *Monthly patterns of smoking topography and smoking rate among college women smokers: A pilot study*  
G. S. Hecht(2), A. Copeland(1), D. E. Kendzor(1) and A. Finley(1), (1) Louisiana State University, and (2) Southern University, Baton Rouge, LA

- 8 *What are the specific cognitive effects of transdermal nicotine and smoking, and do they depend on smoker's gender?*  
B. Kleykamp(1), J. M. Jennings(2), C. L. Sams(1), M. D. Blank(1), M. Weaver(1) and T. Eissenberg(1), (1) Virginia Commonwealth University, Richmond, VA and (2) Wake Forest University, Winston-Salem, NC
- 9 *Gender differences in motivational and valuational processing of visual-rewarding stimuli: Implications for increased propensity to drug dependence*  
W. Chi(1), D. Ariely(2), N. Mazar(2), S. Dunlap(1), S. Lukas(1) and I. Elman(1), (1) McLean Hospital, Belmont, MA and (2) MIT, Cambridge, MA
- 10 *Flutamide reduces benzoyllecgonine levels following cocaine infusion in men*  
R. Yamamoto(1,2), T. L. Barros(1), E. McCarthy(2), C. Mileti(2), T. Juliano(2), A. Looby(2), M. Cote(2), J. F. McNeil(2), D. Olson(1), G. Mallya(2), S. E. Lukas(2), P. F. Renshaw(1) and M. J. Kaufman(1), (1) Brain Imaging Center, and (2) Behavioral Psychopharmacology Research Laboratory, McLean Hospital, Belmont, MA
- 11 *Discriminative-stimulus effects of d-amphetamine in women and men*  
F. Wagner(1), A. Vansickel(1), W. Stoops(1), J. Lile(1), L. Hays(2), P. Glaser(2) and C. Rush(1,2), (1) Department of Behavioral Science, and (2) Department of Psychiatry, University of Kentucky, Lexington, KY
- 13 *Physiological, subjective and hormonal responses to acute psychological stress: Effects of sex and smoking status*  
E. Childs and H. de Wit, University of Chicago, Chicago, IL
- 14 *Estradiol modulation of nociception, morphine antinociception, and reproductive indices in female rats*  
J. Sumner and R. M. Craft, Washington State University, Pullman, WA
- 15 *Estradiol alters COX-1 and COX-2 activities in the lumbosacral region of the spinal cord of OVX female rats*  
T. Kuba, D. Hunter, S. Jenab and V. Quinones-Jenab, Hunter College, New York, NY
- 16 *Estrogen's effects on inflammatory-induced pain are in part mediated through activation of cyclooxygenase (COX) biosynthesis of prostaglandin E2*  
D. Hunter, T. Kuba, N. Amador, K. Shivers, S. Jenab and V. Quinones-Jenab, Hunter College, New York, NY
- 17 *Menstrual cycle phase modulates phencyclidine (PCP) self-administration in monkeys*  
J. L. Newman, J. J. Thorne and M. E. Carroll, Psychiatry Research, University of Minnesota, Minneapolis, MN
- 18 *Enhanced PKA-regulated signaling in female rats may contribute to sex differences in cocaine self-administration*  
W. J. Lynch(1), D. Kiraly(2), B. Caldarone(2), M. Picciotto(2) and J. Taylor(2), (1) University of Virginia, Charlottesville, VA and (2) Yale University, New Haven, CT

**NICOTINE: HUMAN STUDIES**

- 46 *Randomized trial of baclofen for smoking reduction*  
T. R. Franklin, R. Ehrman, D. Harper, K. Kampman, K. Lynch, C. P. O'Brien and  
A. R. Childress, University of Pennsylvania, Philadelphia, PA
- 54 *Progressive ratio responding for cigarette puffs: Effects of dieting status and  
cigarette deprivation in women smokers*  
R. A. Jenks and S. Higgs, The University of Birmingham, Birmingham, UK
- 55 *What elements of MI boost change? Smoking cessation MI interventions in  
women post partum*  
C. Kufeld(1), J. Freyer(2), R. J. Thyrian(2), W. Hannover(3), K. Roske(3), G.  
Bischof(4), U. John(2) and U. Hapke(2), (1) Dresden U. of Technology,  
Dresden, (2) Institute of Epidemiology and Social Medical, and (3) Institute of  
Medical Psychology, University of Greifswald, Greifswald, and (4) University  
of Luebeck, Luebeck, Germany

**ALCOHOL**

- 75 *Factors associated with heavy alcohol use among women in residential drug  
treatment*  
A. A. Alvanzo, D. Svikis and D. Langhorst, Virginia Commonwealth  
University, Richmond, VA
- 76 *Women's alcohol craving and symptoms in early recovery*  
C. M. Coyne, University of Washington, Seattle, WA
- 77 *Self-report and behavioral measures of impulsivity in light and moderate female  
drinkers*  
S. L. Collins(1,2), E. D'Antonio(2) and S. M. Evans(1,2), (1) Columbia  
University College of Physicians & Surgeons, and (2) New York State  
Psychiatric Institute, New York, NY

**ADOLESCENT DRUG ABUSE II**

- 103 *A longitudinal study of pre-sexual risk behaviors and substance use among  
adolescents whose mothers are HIV positive*  
D. Herbeck, M. Mouttapa and D. Murphy, Integrated Substance Abuse  
Programs, University of California, Los Angeles, Los Angeles, CA
- 116 *Sexual abuse and drug involvement among middle school students in Mexico City*  
L. E. Ramos-Lira(1), M. A. Caballero(1), M. T. Saltijeral(1), C. Gonzalez-  
Forteza(1) and F. A. Wagner(2), (1) National Institute of Psychiatry, Mexico  
City, Mexico, D.F., Mexico and (2) DARP & School of Public Health, Morgan  
State University, Baltimore, MD
- 120 *Prenatal substance exposures and DSM-IV disorders in adolescents*  
C. Larkby, L. Goldschmidt, M. Cornelius and N. Day, University of  
Pittsburgh, Pittsburgh, PA

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## Wednesday, June 21, 2006

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- 129 *Gender differences in psychiatric multimorbidity among adolescent substance users admitted to treatment*  
Y. Chan, M. L. Dennis and R. Funk, Chestnut Health Systems, Bloomington, IL

### EPIDEMIOLOGY

- 140 *Male-female contrasts and other variations in exposure opportunity and actual extra-medical use of analgesics in an epidemiological study*  
K. Bohnert and J.C. Anthony, Michigan State University, East Lansing, MI
- 143 *Gender differences in older heroin users*  
A.H. Brown and C.E. Grella, University of California Los Angeles, Los Angeles, CA

### THEORETICAL/COMMENTARY

- 157 *The Colorado Women's Prison Project: Preliminary findings at baseline - substance abuse behaviors, histories, and service needs/utilization of young and mature female offenders*  
M. L. Schoeneberger(1) and J. Y. Sacks(2), (1) National Development and Research Institutes-CIRP, Denver, CO and (2) NDRI-CIRP, New York, NY
- 170 *Substance use during pregnancy in West Central Mexico*  
M. De La Torre-Gutierrez(1), R. Vargas-Lopez(1,3), J. A. Gutierrez-Padilla(1,3), H. Gallardo-Rincon(1), L. Avalos-Huizar(1), A. Campos-Sierra(1) and O. Campollo-Rivas(2), (1) Antiquo Hospital Civil de Guadalajara FAA, (2) Guadalajara Hospital Civil de Guadalajara, and (3) University de Guadalajara, Guadalajara, Jalisco, Mexico



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**Wednesday, June 21, 2006**

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**Symposium VII**

**Salons DE  
1:00 – 3:00 PM**

**NEW APPROACHES FOR ADDRESSING THE CLINICAL CHALLENGES OF TREATING OPIOID-DEPENDENT PREGNANT WOMEN**

Chairs: Karol Kaltenbach and Hendree Jones

- 1:00 *Psychopharmacological management of opioid-dependent pregnant women*  
Peter Martin, The Psychiatric Hospital at Vanderbilt, Nashville, TN
- 1:25 *Voucher-based incentives to reduce drug use during pregnancy*  
Sarah Heil, University of Vermont, Burlington, VT
- 1:50 *Management of pain in mothers given buprenorphine: Intrapartum and postpartum strategies*  
Peter Selby, University of Toronto, Toronto, Ontario
- 2:15 *When change is wanted: Transitioning from short- or long-acting opioids onto buprenorphine*  
Hendree Jones, Johns Hopkins Bayview Medical Center, Baltimore, MD
- 2:40 *Discussant*  
Laura McNicholas, VA Medical Center, Philadelphia, PA

**Oral Communications 14**

**Salons HI  
1:00 – 3:00 PM**

**INFECTIOUS DISEASES OF ADDICTION**

Chairs: Steven L. Batki and Richard S. Schottenfeld

- 1:15 *Blood sharing and gender-based violence among IDUs in Dar es Salaam, Tanzania*  
S. A. McCurdy(1), M. L. Williams(1), G. P. Kilonzo(2), M. W. Ross(1) and M. T. Leshabari(2), (1) University of Texas Houston Health Sciences Center, Houston, TX and (2) Muhimbili University College of Health Sciences, Dar es Salaam, Tanzania
- 1:30 *HIV risk behavior and psychiatric symptoms among heroin addicts in Russia*  
E. M. Krupitsky(1), E. Zvartau(1), V. Egorova(1), M. Tsoy(1), A. Burakov(1), D. Masalov(1), E. Verbitskaya(1), T. Didenko(1), T. Romanova(1), N. Neznanov(1), A. Grinenko(1), C. O'Brien(2) and G. Woody(2), (1) St. Petersburg State Pavlov Medical University, St. Petersburg, Russian Federation and (2) University of Pennsylvania, Philadelphia, PA
- 2:45 *HCV risk factors among street-recruited substance-abusing women*  
D. Nurutdinova, A. Ben Abdallah, S. Bradford, C. Meeks and L. Cottler, Washington University School of Medicine, St Louis, MO

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**Thursday, June 22, 2006**

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**Oral Communications 24**

**Salons ABC  
10:30 AM – 12:30 PM**

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

Chairs: Yehuda Neumark and Conrad Wong

11:00 *A multi-country study of non-dependent alcohol abuse: Male-female differences and other epidemiological patterns*

H. Cheng and J. C. Anthony, Michigan State University, East Lansing, MI

**Brunch with Champions  
(Pre-Registrants Only)**

**McDowell  
12:30 – 2:00 PM**

**Oral Communications 25**

**Salons ABC  
2:00 – 3:00 PM**

**TO SLEEP OR NOT TO SLEEP**

Chairs: Scott Lukas and Richard Foltin

2:00 *Sleep problems in treatment-seeking opiate-dependent individuals*

C. K. Burke, J. M. Pierce, D. Neubauer, N. Punjabi, K. Stoller, K. Neufeld and R. K. Brooner, School of Medicine, Johns Hopkins University, Baltimore, MD

**Oral Communications 26**

**Salons HI  
2:00 – 4:00 PM**

**EPIDEMIOLOGY COUNTS!**

Chairs: Mary-Lynn Brecht and William W. Latimer

2:15 *Mortality and cause of death over 25 years among opiate users: Comparisons by gender and ethnicity*

M. Brecht and C.E. Grella, Integrated Substance Abuse Programs, University of California at Los Angeles, Los Angeles, CA

**SEX MATTERS**

Chairs: Joshua Lile and Nancy Mello

- 2:00 *Cocaine alters hippocampal and striatal progesterone and allopregesterone levels in both male and female rats*  
V. Quinones-Jenab(1), A. C. Minerly(1), A. Akahvan(1), K. Weierstall(1), S. Jenab(1) and C. A. Frye(2), (1) Hunter College, New York, NY and (2) The University at Albany, State University of New York, Albany, NY
- 2:15 *Gender differences in cocaine withdrawal-associated 5-HT 2A serotonin receptor signaling in amygdala*  
G. A. Carrasco(1), W. A. Wolf(2,3) and G. Battaglia(1), (1) Loyola University Chicago, Maywood, IL, (2) Research Services, Hines VA, Hines, IL and (3) University of Illinois at Chicago, Chicago, IL
- 2:30 *Estrous cycle and hormonal influences on cocaine-primed reinstatement of drug seeking in female rats*  
M. W. Feltenstein, R. H. Mehta and R. E. See, Medical University of South Carolina, Charleston, SC
- 2:45 *Progesterone blocks acquisition and expression of cocaine reward through blocking spatial memory formation*  
W. Sun(1,2), S. Russo(1,2), A. C. Minerly(1,2), K. Weierstall(1,2), A. Nazarian(1,2), E. Festa(1,2), T. Niyomchai(1,2), A. Akahavan(1), V. Luine(1,2), S. Jenab(1,2) and V. Quinones-Jenab(1,2), (1) Hunter College, and (2) Graduate Center of CUNY, New York, NY
- 3:00 *Interactions of gender and menstrual cycle phase with progressive ratio measures of cocaine self-administration in cynomolgus monkeys*  
N. K. Mello, I. M. Knudson and J. H. Mendelson, Alcohol and Drug Abuse Research Center, McLean Hospital-Harvard Medical School, Belmont, MA
- 3:15 *Estradiol enhances the discriminative-stimulus and self-reported effects of d-amphetamine in healthy pre-menopausal women*  
J. A. Lile, S. L. Kendall, S. Babalonis, C. A. Martin and T. H. Kelly, University of Kentucky, Lexington, KY
- 3:30 *Toward a better understanding of the relationship between gender and crack/cocaine use*  
E. K. Reynolds(1), M. A. Bornovalova(1), S. B. Daughters(1), J. J. Curtin(2) and C. W. Lejuez(1), (1) University of Maryland, College Park, MD and (2) University of Wisconsin, Madison, WI
- 3:45 *Gender differences in patterns of adolescent smoking: Potential effects of social environment*  
E. Luther, M. Jaszyna-Gasior, K. S. Bagot, E. Thorner, M. B. Royo, M. Leff and E. T. Moolchan, National Institute on Drug Abuse, Baltimore, MD

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**Thursday, June 22, 2006**

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## ABSTRACTS

### **CONTRASTING GENETIC MODELS FOR LIFETIME COMORBIDITY OF CANNABIS AND OI D USE AND PROBLEM USE IN AUSTRALIAN ADULT TWINS**

*A. Agrawal, M. Lynskey, M. Neale, K. Bucholz, N. Martin, P. Madden and A. Heath, Washington University School Medicine, St. Louis, MO, Virginia Commonwealth University, Richmond, VA and QIMR, Brisbane, Queensland, Australia*

Causal and correlative processes may contribute to the association between cannabis and other illicit drugs (OID). Genetically informative studies support the role of heritable and environmental influences on the liability to use or misuse illicit drugs. We contrast mechanisms by which these genetic and environmental risk factors contribute to the association between cannabis and OID use and problem use (one or more symptoms of abuse/dependence) using a large dataset (N=4179) of adult (mean age= 30 yrs) male (42%) and female twins. We evaluated thirteen possible mechanisms to explain the lifetime comorbidity of cannabis and OID use and problem use. Substantial heritability was found for cannabis use (46%) and problem use (53%) and OID use (38%) and problem use (62%) with modest evidence for shared environmental influences (10-36%) on use. Latent genetic ( $R_g=0.66-0.95$ ) and environmental factors ( $R_e=0.04-0.51$ ) influencing cannabis and OIDs were correlated. An alternative model, where the liability to cannabis use and problem use had a reciprocal causal influence on the liability to OID use and problem use, could not be rejected. For comorbid drug use, and especially in women, using cannabis resulted in an independent increase in the likelihood of using OIDs, even in women that were not otherwise vulnerable to using OIDs. No other quantitative sex differences were noted. Despite support for a correlated vulnerabilities model, consistent with the “gateway” hypothesis, high-risk cannabis users were at increased risk for OID use, implying that a combination of correlative and causal processes govern this association. These results were also similar to previous findings from an independent sample of adult twins from Virginia, U.S.A. Despite cultural differences in perceptions regarding cannabis use in the U.S. and Australia, similar mechanisms may be contributing to the comorbidity across these drug classes in both populations. Support: AA07728, AA11998, AA13321, DA12854 & AA10249

### **COCAINE DECREASES PROGESTERONE SYNTHESIS IN PLACENTAL CELLS AND ELEVATES PROSTAGLANDIN LEVELS IN THE AMNIOTIC FLUID DURING PREGNANCY IN HUMANS**

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To assess fetal placental endocrine axis functions in cocaine users, studies were conducted in vitro and in situ. For in vitro study, placentas were obtained immediately following delivery from subjects (10) who were drug free (licit or illicit) throughout pregnancy (control subjects). Placental cells (cytotrophoblast cells  $1 \times 10^6$ ) were isolated and incubated in media containing 1-3  $\mu$ molar cocaine along with either substrate (25 hydroxycholesterol or low density lipoprotein). Progesterone was isolated from the incubate and quantitated using radioimmunoassay. The data show that progesterone synthesis was significantly decreased in the cocaine treated cytotrophoblast cells ( $p < 0.01$ ) in cocaine treated cytotrophoblast cells. The results of this study show that 1) progesterone synthesis in cytotrophoblast cells decreased significantly ( $p < 0.01$ ) in the presence of cocaine and 2), PGE2 and PGF2<sub>α</sub> levels were significantly increased in the amniotic fluid in cocaine user ( $p < 0.01$ ) and cocaine caused decrease in cAMP levels in cocaine treated cytotrophoblast cells. It is concluded that adverse outcome of pregnancy in cocaine users in humans is caused by altered placental-fetal endocrine functions.

### **FACTORS ASSOCIATED WITH HEAVY ALCOHOL USE AMONG WOMEN IN RESIDENTIAL DRUG TREATMENT**

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Background: Patients with comorbid alcohol and drug use disorders tend to have more severe substance use disorders and often have poorer treatment outcomes than those with a single disorder. The primary aim

of this study was to examine factors related to heavy alcohol use in women in residential drug treatment. Methods: Participants were 159 women in a residential drug treatment facility. Data was collected using the Addiction Severity Index (ASI), a semi-structured interview performed at study intake. All women provided informed consent as part of a larger research study on the effects of behavioral incentives on attendance and retention in residential drug treatment. Demographically, women were in their late 30's (mean age 37.2, SD 7.19), had completed 11.3 years of school (SD 2.01), and were predominantly African American (74.8%). Defining heavy alcohol use as > 3 drinks/day, we analyzed the number of days of heavy alcohol use in the previous 30 days and total alcohol consumption in the previous 30 days. Covariates included age, race, years of education, as well as 30 day history of depression, anxiety, suicidal thoughts, medical problems, abuse (physical, sexual, or emotional), cocaine use, and heroin use. Bivariate analyses were performed using student's t-tests and Pearson's correlation coefficient for linear regression. Results: Heavy alcohol use was present in 27.7% of women. Days of heavy drinking was associated with depression (7.7 days vs. 2.2 days,  $p < .0001$ ), and days of cocaine use ( $r = 0.308$ ,  $p < .0001$ ). Total alcohol consumption in 30 days was associated with depression (62.1 drinks vs. 16.8 drinks,  $p .017$ ). Implications: Results suggest that heavy alcohol use in drug abusing women is associated with depression and cocaine but not heroin use. Study findings support the importance of screening for and treating depression in women in substance abuse treatment. This research was supported by NIDA DA 11476 and NIAAA AA 11802

### **TOBACCO USE IN A RESIDENTIAL SAMPLE OF DRUG-DEPENDENT WOMEN**

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The present study identified correlates of smoking in a sample of drug dependent women in residential treatment. Participants were 163 women who provided informed consent to participate in a behavioral incentive drug abuse research study. They had a mean age of 37.2 years (SD= 7.2) and 73% were African American. Approximately three-fourths of the sample reported lifetime history of depression (76.7%) and anxiety (71.8%). Participants were categorized as smokers (N=124; 76%) or nonsmokers (N=39; 24%) based on Addiction Severity Index (ASI) data. On average, smokers used cigarettes 28 days out of the last 30, smoked 16 cigarettes per day, had been smoking regularly for 16 months, and began smoking at age 20. Smokers reported a higher lifetime prevalence of depression (81% vs. 64%;  $F[161, 55] = 10.3$ ,  $p < .001$ ) and anxiety (76% vs. 59%;  $F[161, 57] = 13.1$ ,  $p < .05$ ) than nonsmokers. Smoking frequency in the past 30 days was significant with cigarettes per day (cpd) ( $F[15, 142] = 24$ ,  $p < .001$ ), age of first cigarette use ( $F[14, 145] = 3.4$ ,  $p < .001$ ), and months of regular cigarette use ( $F[15, 147] = 6.1$ ,  $p < .001$ ). Smokers increased their frequency of smoking from intake into the program to discharge from the program by 4.3 days per month (20.1 days vs. 25.6 days out of the past 30;  $p < .05$ ). However, cpd decreased from intake to discharge by 5 cpd (15 cpd vs. 10 cpd;  $p < .001$ ). Findings suggest that drug dependent women with comorbid smoking are more likely to report a lifetime prevalence of anxiety and depression. Results also suggest that female smokers in a residential drug abuse treatment program will increase the number of days per month that they smoke cigarettes, but decrease cigarettes smoked per day. This research was supported by NIDA DA 11476 CORRESPONDING AUTHOR: Lynn Anderson, VCU, Box 980343 Richmond, VA 23298 USA.

### **EFFECTS OF PROGESTERONE AND ESTROGEN ON REINSTATEMENT OF COCAINE-SEEKING BEHAVIOR IN FEMALE RATS**

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Phase of estrous cycle modulates i.v. cocaine self-administration in rats. Estrogen facilitates the acquisition and reinstatement of cocaine self-administration when administered to ovariectomized (OVX) rats. Recently, it has been shown that progesterone (P) decreases the rate of cocaine acquisition in female rats (Hu et al. 2004). The purpose of the present study was to study the short-term effects of estrogen (0.05 mg/kg estradiol benzoate, EB) and P (0.5 mg/kg) on the reinstatement of cocaine-seeking behavior in female rats. Rats were implanted with i.v. catheters, and they received a bilateral ovariectomy. They were then placed in operant chambers and trained to lever press for 0.4 mg/kg cocaine infusions under a FR 1, 20-sec, timeout schedule of reinforcement during daily 2-hr sessions until behavior was stable for 14 days. The cocaine reservoir was then replaced with saline, and a 21-day extinction period began. After extinction, rats were separated into one of three treatment groups (i.e., OVX+EB, OVX+EB+P, or OVX+VEH). At this time the house light, lever lights, and pump were disconnected and VEH, EB, or

EB+P was administered 30 min prior to the onset of each daily session until the completion of the study. After three days of hormone treatment rats received a reinstatement procedure in which alternating days of a single saline or cocaine (5, 10, or 15 mg/kg in mixed order) i.p. priming injection was administered at the beginning of each experimental session for six consecutive days. Responding during the maintenance and extinction phases was similar across all groups. Estrogen treatment in the OVX+EB group increased reinstatement at the 10 mg/kg dose relative to the OVX+EB+P and the OVX+VEH groups that had similar low levels of responding. The suppression of cocaine induced reinstatement responding following an injection of progesterone and estrogen suggests a possible role for progesterone in the therapeutic prevention of relapse of cocaine seeking behavior. Supported by R01 DA03240 and K05 DA15267 (MEC).

## **GENDER DIFFERENCES IN SEX TRADE BEHAVIOR AND INJECTION DRUG USE AMONG SOUTH AFRICAN DRUG USERS**

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There is a major gap in research findings related to HIV transmission in Sub-Saharan Africa given the magnitude of the pandemic in the region. The present study sought to examine gender differences in sex trade behavior and injection drug use among South African drug users as an initial step in a line of investigation aimed at reducing HIV in the region. This study is based on data from the International Neurobehavioral HIV Study, an epidemiological examination of neuropsychological, social, and behavioral risk factors of HIV, and Hepatitis A, B, and C in the U.S, South Africa, and Russia. The present study is based on the South Africa sample comprised of 144 drug users between 18 and 50 years of age in the Pretoria region. The Pretoria baseline sample was 91% Black and 65.3% male with 33.3% of the baseline sample testing positive for HIV. Multinomial logistic regression indicated that females (OR = 18.49; 95% CI = 7.47; 45.80) were significantly more likely than males to engage in sex trade behavior while controlling for age. Specifically, 66% of females in the sample reported trading sex for money compared to 9.6% of males. There was no gender difference in the rate of injection drug use. There is a lack of research elucidating risk factors associated with the transmission of HIV and other STDs in South Africa. A small base of extant research suggests that HIV transmission among South African women is largely attributable to sexual behavior rather than other risk factors, such as sharing needles to inject drugs. The present study suggests that an alarmingly high prevalence of sex trade behavior among women in South Africa may explain, in part, extremely high HIV rates among women in Sub-Saharan countries.

## **ESTRADIOL MODULATION OF THE BEHAVIORAL EFFECTS OF D-AMPHETAMINE IN PREMENOPAUSAL WOMEN**

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Previous research suggests that d-amphetamine alters impulsive 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 behavioral effects of d-amphetamine, alone and in combination with estradiol, in healthy, premenopausal women. Volunteers complete 10 experimental sessions during the early follicular phase of their menstrual cycle and are administered estradiol (0.00 or 0.25 mg, sublingual) and d-amphetamine (0 or 16 mg, p.o.) in combination under doubleblind, 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 Scale and Profile of Mood States), and computer tasks designed to assess psychomotor (Digit Symbol Substitution) and impulsive (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, 6 of 10 subjects have completed or are completing 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 arousal and vigor. 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.

## **DISRUPTION OF THE NEURONAL NITRIC OXIDE SYNTHASE GENE PREVENTS NEUROADAPTATIONS INVOLVED IN THE MAINTENANCE AND REINSTATEMENT OF COCAINE CONDITIONED PLACE PREFERENCE IN ADOLESCENT MICE**

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Ample evidence exists for the remodeling of the mesocorticostratial and mesolimbic dopamine and glutamate systems during adolescence. These circuits are major substrates for psychostimulants and, consequently, exposure to drugs during adolescence may disrupt normal neural development. Additionally, the role of nitric oxide (NO) as an important modulator of DAergic and glutamatergic neuronal function suggest that it may be involved in the neuroplasticity underlying the addictive properties of psychostimulants. The present study investigated the induction, maintenance, extinction, and reinstatement of cocaine-induced conditioned place preference (CPP) in WT and nNOS KO mice in order to determine age-sex-dependent differences in drug-seeking behavior. All animals developed marked cocaine CPP (20mg/kg), regardless of genotype, age and/or sex. WT adolescent males and females (PD24) maintained CPP for one and two weeks post-conditioning, respectively, and WT adult animals (PD89) maintained CPP for four weeks. A priming injection of cocaine (5mg/kg) to the WT adolescent groups (both sexes) reinstated CPP in adulthood (PD70), suggesting the development of long lasting sensitivity to cocaine. Likewise, cocaine priming reinstated CPP in WT adult animals (both sexes). In contrast to WT adolescent, KO adolescent mice (both sexes; PD26) did not maintain CPP expression nor did they respond to a cocaine priming injection. KO adult males like their adolescent counterparts neither maintained CPP nor responded to a cocaine prime. Results of KO adult females, however, were indistinguishable from WT adult females. The present results demonstrate that the nNOS gene is required in adolescence for the development of neuroadaptations that enable the maintenance and reinstatement of CPP, and suggest that the nitroergic system may be critically involved in the development of persistent drug seeking behavior from adolescence through adulthood. Supported by NIDA DA19107.

## **MATERNAL BLOOD AND ORGAN TOLUENE LEVELS AFTER ACUTE AND REPEATED BINGE EXPOSURES**

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Inhalant abuse is an increasing form of drug abuse. Of particular concern is the abuse of inhalants during pregnancy. While postnatal outcomes in offspring exposed prenatally to inhalants are being assessed, little is known about impact of inhaled toluene on pregnant women. The present study assessed the distribution of toluene in blood and body tissues of pregnant rats after brief, high-dose, 15-min toluene exposures modeling maternal binge inhalant abuse. Timed-pregnant Sprague-Dawley rats were exposed to toluene at 0, 8000, 12000, or 16000 parts per million (ppm) for 15 min/exposure. Exposures occurred twice each day from gestational day 8 (GD8) thru GD20. Immediately following the 2nd exposure on GD8 and GD14, blood was taken from the saphenous vein. Following the final exposure on GD20, animals were sacrificed and trunk blood was collected along with maternal tissue specimens from cerebellum, heart, lung, kidney and liver. Results demonstrate that peak toluene blood concentrations (TBCs) increased as the inhaled concentration of toluene increased. TBCs observed in cerebellum and lung at GD20 were higher than in blood suggesting these tissues concentrate toluene. TBCs in heart and liver at GD20 were similar for all toluene doses suggesting that these organs may become saturated. Overall, TBCs in blood and other tissues following repeated toluene exposure demonstrate that toluene readily reaches many potential sites of action. Prior studies in non-pregnant animals report decreasing TBCs with repeated toluene exposure suggesting a metabolic tolerance that was not seen in these pregnant animals. These results imply that factor(s) related to pregnancy may alter development of tolerance. The relationship of maternal tolerance to fetal outcome remains to be determined. (Supported by grants DA15095 and DA15951 to SEB).

## **CHRONIC EXPOSURE TO ANALGESIC DOSES OF OXYCODONE DOES NOT ALTER FEMALE REPRODUCTIVE FUNCTION IN RATS**

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Oxycodone is a potent mu opioid receptor agonist used in chronic pain management. Although oxycodone is an effective analgesic, the long-term consequences of chronic use especially in females of reproductive age have not been adequately studied. This objective served as the basis for our present study. Adult



female Sprague-Dawley rats were used (n=8 per group). During the 10 day pretreatment phase, rats were adapted to an oral gavage procedure with water to minimize stress effects. Baseline measures of nociception were recorded using a hotplate set at 52 degrees C and estrus cycle was monitored via histological assessment of vaginal smears. This was followed by a treatment phase wherein doses of 5 or 10 mg/kg/day were orally gavaged for 5 days. The dose was then escalated by 0.25 or 0.5mg/kg/day for 10 days to a final dose of 7.5 or 15mg/kg/day, which was maintained for 15 days. Vaginal smearing was done daily and hot plate latency was assessed 3 times a week. After 30 days of treatment, rats were bred and their pregnancy was monitored. Statistical analysis revealed that both doses of oxycodone were effective analgesics. The latency for low dose oxycodone treated rats nearly doubled from a baseline of 9.5 sec to approximately 16 sec, while the high dose rats' latencies increased 3 fold from 8.1 sec to approximately 24 sec. In contrast, oxycodone treatment did not affect % of estrus cycles that were normal (75-85%), average cycle length (4.0-4.4) and pregnancy rate (75-100%). These data suggest that chronic exposure to analgesic doses of oxycodone did not interfere with the normal reproductive function of the female rat, including the ability to become pregnant. Supported, in part by the Board of Regents, State of Louisiana, LEQSF RD-A-19.

### **MALE-FEMALE CONTRASTS AND OTHER VARIATIONS IN EXPOSURE OPPORTUNITY AND ACTUAL EXTRA-MEDICAL USE OF ANALGESICS IN AN EPIDEMIOLOGICAL STUDY**

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**BACKGROUND:** Extra-medical use of analgesic drugs is of public health importance. Elsewhere, there is evidence of male-female (M-F) differences in the chance to try heroin, but not in the transition from opportunity to heroin use, but no evidence exists on these transitions for extra-medical use of analgesic medicines. This study probes these M-F differences and other variations. **AIM:** In epidemiological research, we estimate risk of (a) having a 'chance to try' analgesics for extra-medical reasons by young adulthood, and (b) once this chance occurs, the probability to transition into extra-medical analgesic use. **METHODS:** Data are from young adult assessments of 2,311 first-graders who started school in 1985-86. Multiple logistic regressions estimate subgroup variation with respect to analgesic transitions. **RESULTS:** Females were just as likely to have had a chance to try analgesics and also to have used analgesics, as compared to males ( $p>0.05$ ). Being non-Hispanic white was associated with greater chance to try analgesics (adjusted relative risk, aRR~3.7;  $p<0.05$ ) and transition from opportunity to use (aRR~2.7;  $p<0.05$ ). Subsidized lunch at school entry was inversely associated with chance to try (aRR~0.7;  $p<0.02$ ) and with transition into use (aRR~0.6;  $p<0.05$ ). **DISCUSSION:** In relation to extramedical analgesic drug use, M-F differences in opportunity to use and transition to first use were not observed, but this research has disclosed epidemiological patterns of variation that deserve future scrutiny. **SUPPORT:** NIDA K05DA015799 and MSU research funds.

### **BEHAVIORAL FUNCTIONS OF SEXUAL BEHAVIOR ACROSS REGULAR, CASUAL, AND COMMERCIAL PARTNERS AMONG URBAN DRUG USERS WITH A HISTORY OF CHILDHOOD VICTIMIZATION: GENDER AND CONTEXT**

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Risky Sexual Behavior (RSB) and its role in HIV infection is a significant public health concern that is especially relevant for chronic inner-city drug users. A wealth of literature has suggested that childhood trauma is related to later-life RSB, including multiple short-term sexual encounters, exchange of sex for money, drugs, or shelter, unprotected sex, and the contraction of STDs. Despite this consistent and robust association, few studies have explored the reasons behind this phenomenon. As such, the present study utilized a novel method of understanding this association by focusing on the behavioral functions of RSB, with additional analyses testing potential differences across gender and partner type (i.e., casual, commercial, and regular) among a sample of 110 chronic, inner-city drug users. A principal component analysis (PCA) indicated a two-factor solution across regular, casual, and commercial. Specifically, the first function of RSB concerned motives of intimacy, and the second consisted of emotional avoidance (i.e., maladaptive coping) and self-punishment. Reliability for these factors ranged from acceptable to excellent (all alphas were greater than .70). Using the scales derived from the PCA solution for casual and commercial partners, childhood victimization (across sexual, physical, and emotional abuse) was significantly related to avoidance/self-punishment motives, but unrelated to intimacy motives of intimacy.

In contrast, childhood victimization was not related to the avoidance/self-punishment motives in sexual acts with a regular partner, but was negatively related to intimacy motives, suggesting an inability to function in an intimate romantic relationship. This latter finding was especially strong among women. The current study is the first to empirically explore the behavioral functions of RSB among victimized individuals, and results are discussed in the context of prevention and treatment.

### **DRUG USE AND THE DAST-10: DIFFERENCES AMONG COLLEGIATE SEXUAL MINORITY WOMEN**

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This exploratory study investigated past year drug use among lesbian, bisexual, unlabeled and heterosexual women in college. In addition, a modified version of the Drug Abuse Screening Test (DAST-10) was administered to assess drug problems. The present study was a Web-based survey, conducted from January through February of 2005 at a large mid-Western university. A random sample of full-time undergraduate students was drawn from the Registrar's Office. The response rate for women was 70%. The final sample for the current investigation was n=2440. Past year drug use was assessed for the following types of drugs: marijuana/hashish, cocaine, LSD, other psychedelics, crystal methamphetamine, heroin, inhalants, ecstasy, as well as the illicit use of four classes of prescription medications. Age, race and living arrangement were entered as control variables. Results from logistic regression analyses revealed that bisexual women were more likely than heterosexual women to report past year marijuana use, as well as any past year drug use. When assessing DAST-10 scores (0–10), the mean for heterosexual women was significantly lower than that of lesbians, bisexual women and unlabeled women. Results from linear regression analyses showed that a non-heterosexual identity significantly predicted DAST-10 scores. These findings suggest important differences in both drug use behaviors as well as drug use problems among sexual minority women. Practice implications include the need for prevention and intervention programs that specifically target sexual minority women. The current study also highlights the need for more research among sexual minority populations to better understand the myriad factors that influence substance use among such groups, and how both antecedents as well as consequences of use may differ. This project was supported by research grants DA07267 (PI: Boyd) and DA018239 (PI: McCabe) from the National Institute on Drug Abuse.

### **MORTALITY AND CAUSE OF DEATH OVER 25 YEARS AMONG OPIATE USERS: COMPARISONS BY GENDER AND ETHNICITY**

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Hypothesis: Previous studies have shown higher death rates for opiate users than for the general population; however, information is limited on the relative risks for gender and ethnic subgroups. Procedures: This study analyzes mortality statistics and causes of death over a period of 25 years for 914 opiate-dependent individuals who were sampled from methadone maintenance clinics in California in 1979-80. Data were obtained from the National Death Index on date and cause of death information for members of the original study cohort. Analyses: Analyses included years of potential life lost (YPLL) and standardized mortality ratios (SMR). Results: Over the period 1979-2003, 265 deaths (193 males, 72 females) were confirmed in the sample. YPLL (compared to age 75) for those who died averaged 25.8 years per person, about 3 times more than for the U.S. population under 75 years. Most common underlying causes of death were alcohol/drug overdose accounting for 22% of deaths, cancer (16%), liver (13%) and cardiovascular diseases (12%); these causes as well as less prevalent respiratory disease, hepatitis, suicide, and homicide had substantially higher YPLL rates than the U.S. population. Average age at death was 46.7 for females and 50.1 for males ( $p < .001$ ). Based on SMR, study subjects were 2.6 times more likely to die than individuals of comparable age/gender/ethnicity in the general population, with highest SMR for alcohol/drug abuse, liver and respiratory diseases, and suicide. Most vulnerable demographic subgroups included non-Hispanic white females ages 25-34 (SMR=5.8), 35-44 (SMR=4.6), 45-54 (SMR=5.7); Hispanic females ages 45-54 (SMR=6.5) and 55-64 (4.2); African-American females ages 35-44 (SMR=3.5); and non-Hispanic white males ages 35-44 (SMR=4.2) and 45-54 (SMR=4.4). Conclusion: Opiate users, particularly females, have elevated risk of mortality; public health interventions,

within drug treatment and other health services, should be developed to reduce the risks of premature mortality. Supported by National Institute on Drug Abuse (R01-DA015390 and P30-DA016383).

### **DETERMINANTS OF RACIAL DISCRIMINATION IN ADULTHOOD AND ITS RELATION TO FREQUENCY OF COCAINE AND MARIJUANA DRUG USE**

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Background: Studies about the harmful effects of perceived racial discrimination on health have achieved some recognition in public health. Aim: This study (1) investigated which factors during childhood, adolescence and young adulthood are associated with discrimination in young adulthood among African Americans; (2) determined the relation between discrimination and marijuana and cocaine use; and (3) explored gender differences. Methods: Data analyzed come from a cohort of children who started school in Woodlawn – a mostly black and inner city neighborhood located on the south side of Chicago. Measures were collected at three time points: first grade (age 6-7); adolescence (age 15-16); and young adulthood (age 33-34). Results: Seventy percent of the sample reported at least one experience of discrimination among six domains. There were gender differences in perceived discrimination (80% for men and 60% for women). In ordered logistic regression analyses, increased risk of perceived racial discrimination was associated with the following: gender, interpersonal aggression, criminal victimization, U.S. region of the country where one resides, paranoid feelings, and poverty. Using multinomial logistic regression, the results indicated that men who perceived discrimination were more likely to be experimental, former, current moderate, or current heavy marijuana users and current heavy cocaine users. Women who perceived racial discrimination tended to be experimental, former, and current heavy marijuana users, and also experimental and former cocaine users. Conclusion: This investigation explores the association between perceived racial discrimination and drug use over the life course. Future research should continue to explore individuals at high risk of perceiving racial discrimination and to evaluate potential moderators and mediators related to perceived racial discrimination.

### **GENDER DIFFERENCES IN OLDER HEROIN USERS**

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Limited information is available regarding aging drug addicts, yet this population is increasing. As part of a long-term follow-up study of gender differences among older heroin users, 8 gender-specific focus groups were conducted with 38 (19 men, 19 women) older (aged 50+) heroin users. Approximately half of the sample was African American, 29% Caucasian, 8% Hispanic, and 8% other. Almost two-thirds was currently on methadone; 55% reported illegal substance use in the past year. Nearly all (95%) had been incarcerated during their lives. Interviews were analyzed using constant comparative method in ATLAS.ti. Gender differences were apparent in the content and the interactional styles within the groups. Male participants glorified the past, strived to impress one another, and remained fairly abstract in their discussions. They talked extensively about incarceration, including relapse following release. Few were in relationships with significant partners or described ongoing relationships with their children. Some of the male participants stopped using “cold turkey.” Quitting was typically precipitated by drug-related deaths of loved ones. Female participants tended to be more introspective and often tried to analyze one another. They described using primarily with their partners, and several had been in long-term marriages. Sixteen women had children, but not all were in contact with them. Several of the women described traumatic childhood experiences, including sexual abuse, and many had used drugs to self-medicate. Female participants spoke about sexual behaviors (e.g., prostitution) in which they engaged in order to maintain their habits. Gender did not differentiate health effects of heroin, in that men and women described similar physical and psychological problems. Aging current and former drug users face many potential long-term health problems, as well as lack of support systems and resources; some of these issues differ by gender. Considering the steady rise in aging individuals seeking treatment, more research needs to address issues specific to male versus female older users. Supported by NIDA 5 R01 DA015390-02 & P30 DA016383.

### **THE EFFECTS OF NICOTINE CONDITIONED PLACE PREFERENCE IN D2-PRIMED ADOLESCENT RATS: AGE-RELATED AND GENDER EFFECTS**

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Past studies from this laboratory have shown that neonatal treatment with the dopamine D2/D3 agonist quinpirole produces long-term priming of the D2 receptor. This study was designed to analyze the associative effects of nicotine in this D2-priming model utilizing the conditioned place preference (CPP) paradigm in adolescent rats. In Experiment 1, male and female Sprague-dawley rats were neonatally treated with quinpirole or saline from postnatal days (P1-21) and raised to adolescence (P30). Beginning on P30, animals were conditioned for eight consecutive days to the non-preferred white compartment in a CPP apparatus through administration of nicotine 15 mins before being placed in this compartment, and administered saline 4 h later before being placed into the black compartment. The control group was administered saline 15 mins before being placed into either compartment. On a post-conditioning test with the divider removed, male rats (P39) administered nicotine demonstrated a stronger preference for the white compartment as compared to controls, whereas female rats did not demonstrate a drug-induced preference. Beginning the next day on P40, animals were trained for eight more consecutive days following the identical procedure, but nicotine did not produce CPP. In Experiment 2, training began on P23 following the identical procedure as Experiment 1, and nicotine induced CPP in both male and female rats at P30, but neonatal quinpirole did not produce any effects. Further training for eight more days only increased nicotine-induced CPP when animals were later tested at P38, again not affected by neonatal quinpirole treatment. This study demonstrates that the associating effects of nicotine are age-related in adolescence and are gender-specific, but do not appear to be affected by D2 receptor priming. Support Contributed By: ETSU honors program

### **SLEEP PROBLEMS IN TREATMENT-SEEKING OPIATE-DEPENDENT INDIVIDUALS**

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Previous studies have explored the link between the treatment of opiate dependence and sleep problems, but there is virtually no data on sleep function prior to initiating a new treatment episode. We examined the sleep problems and ASI composite scores for 144 chronic and severe substance users upon admission to opiate agonist treatment. Sleep function in the past 30 days was assessed with the following self report measures: (1) Medical Outcomes Study sleep questionnaire, a measure of perceived sleep quality; (2) Epworth Sleepiness Scale, a measure of daytime sleepiness; (3) Functional Outcomes of Sleep Questionnaire, a measure of the effect of sleepiness on daily functioning; and (4) a set of questions about licit and illicit substance use to increase or decrease sleepiness. This treatment-seeking sample was relatively young (mean 35 years), predominately female (83%), minority (75%), and unemployed (86%). A substantial minority (21%) had transferred from an opiate agonist treatment program for pregnant women. Overall, participants reported significantly poorer sleep quality and more daytime sleepiness prior to enrolling in treatment than non-clinical normative samples, but did not report a high level of subjective dysfunction due to sleepiness. As expected, sleep problems were related to greater recent psychiatric distress and, to a lesser extent, family and social problems. In addition, the majority of participants (83%) reported substance use specifically to increase or decrease sleepiness. Of this group, 89% reported the use of illegal drugs for that purpose. Greater substance use to increase or decrease sleepiness was associated with more sleep problems. No overall gender differences were found, but those transferring from a methadone program for pregnant women differed from other participants on ASI composite scores and sleep problems. Results suggest that the assessment of sleep problems endorsed by patients entering treatment is warranted.

### **PREDICTORS OF YOUTH SUBSTANCE USE IN SUBSTANCE-ABUSING FAMILIES**

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Children of substance-abusing parents (SAPs) are at greater risk for psychopathology and substance use in adolescence relative to children in the general population. Family functioning may be an important mechanism by which parent psychopathology contributes to youth psychopathology and substance use. However, no studies have examined how this process might differ for substance abusing mothers vs. fathers. Participants included 324 adolescents from 224 families in which at least one parent sought treatment for substance-dependence. We used structural equation modeling (SEM) to test mother and father perceptions of family functioning as mediators of relations between parent psychopathology (Mother Internalizing, Mother Externalizing, Father Internalizing, and Father Externalizing) and youth internalizing,

externalizing, and substance use. Family Functioning constructs consisted of mother and father ratings of cohesion, communication, disorganization, and lack of support. The final model fit the data adequately ( $\chi^2(81)=176.76, p=.00; TLI=.81; RMSEA=.06$ ) and indicated that only father externalizing and mother internalizing problems were significantly related to father ( $\beta=.46, p<.05$ ) and mother ( $\beta=.56, p<.05$ ) family functioning ratings, respectively. Father family functioning ratings were related to youth internalizing and externalizing problems ( $\beta=.48, p<.05$  and  $\beta=.51, p<.05$ , respectively). These results suggest that family functioning mediates relations between father externalizing problems and youth psychopathology. Father internalizing problems ( $\beta=-.23, p<.05$ ) were also direct predictors of fewer youth externalizing problems. Further, family influences on youth substance use were indirect, acting through relations with youth internalizing and externalizing problems. Such findings that pathways to youth problems vary by parent gender can inform prevention and/or treatment with substance-abusing mothers and fathers. Supported by NIDA DA10821 and F31DA017999.

## **ARREST HISTORY AS A CRITICAL INDICATOR OF RISK AMONG COCAINE USING WOMEN**

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In 2005, NIDA focused on health disparities among drug users to better understand the impact of health and social problems related to drug use on minorities. Rates of HIV and other consequences of drug use, including incarceration, disproportionately affect minorities. The present analysis aims to shed light on health disparities among cocaine using women enrolled in a peer delivered HIV prevention study (DA 11622; PI: Cottler) by comparing women referred from the St. Louis Female Drug Court (CT,  $n=124$ ) to community recruited women, both with any lifetime arrest (COM+,  $n=232$ ) and without (COM-,  $n=140$ ). Sociodemographic characteristics of the 496 females who reported using any form of cocaine 6 or more times reveal that they are primarily African-American (86%), never married (61%), undereducated (44% HS+), and living in poverty (90%). CT women were younger (36.3,  $SD=5.6$ ) than either COM+ (39.3,  $SD=6.8$ ) or COM- (39.0,  $SD=7.3$ ). Women with a lifetime arrest history were younger to initiate cocaine use than those with no arrest history (mean age: 24.5 CT, 26.2 COM+, 28.6 COM-). Lifetime polysubstance use was reported across groups, with 91% reporting both alcohol and tobacco use, and 72% reporting cannabis use. CT women were more likely, than others, to report lifetime heroin use (23%; 18% COM+, 4% COM-), and history of injection drug use (32% CT; 23% COM+, 6% COM-). Approximately 60% of the sample met DSM-IV criteria for alcohol, 26% for cannabis, and 81% for cocaine dependence; CT women were more likely to meet criteria for cocaine dependence (96%; 84% COM+, 65% COM-), and opiate dependence (22%; 18% COM+, 3% COM-) than either of the community recruited groups. Surprisingly, COM+ reported more cocaine using days in the prior 30 days than either the CT or COM- women (13.9 COM+, 7.7 days CT, 11.0 COM-), suggesting that women in this less visible, but clearly high-risk, group should be a specific target for future interventions. Interventions aimed at delving below the tip of the iceberg, to alter the trajectory for high-risk women outside the formal criminal justice system, are warranted.

## **GENDER DIFFERENCES IN COCAINE WITHDRAWAL-ASSOCIATED 5-HT<sub>2A</sub> SEROTONIN RECEPTOR SIGNALING IN AMYGDALA**

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We have previously reported that in hypothalamus of male rats, withdrawal from cocaine: (1) increases 5-HT<sub>2A</sub> receptor-mediated function, and (2) increases the levels of 5-HT<sub>2A</sub> receptor-associated G<sub>q</sub> and G<sub>11</sub> G-proteins (EJP 221:121,1992 & JPET 307:1012,2003). These effects were not observed in female rats after a comparable cocaine treatment and withdrawal paradigm. The present study investigated the effects of cocaine withdrawal in male and female rats on: (1) 5-HT<sub>2A</sub> receptor function in amygdala and (2) G<sub>q</sub> and G<sub>11</sub> protein levels in basolateral (BL) and central (Ce) amygdala. Adult male and female ovariectomized rats received saline or cocaine (15 mg/kg, ip, bid) for 5 days and withdrawn for 48 h. Changes in G-protein activation of phospholipase C (PLC) and 5HT<sub>2A</sub> receptor-stimulated PLC activities in amygdala were determined by GTP<sub>S</sub>-increases in PLC activity and serotonin (5-HT)-stimulated activity above GTP<sub>S</sub>-stimulated PLC activity, respectively. In male rats, cocaine withdrawal produced increases in: (1) 5-HT<sub>2A</sub>- and G protein-stimulated PLC activities (80 and 110 pmol/mg protein/min over control, respectively) and (2) levels of membrane-associated G<sub>q</sub> and G<sub>11</sub> Gproteins in BL amygdala (52-60% for

G<sub>11</sub> and G<sub>q</sub>) and Ce amygdala ( $\approx 48\%$  for G<sub>q</sub> and G<sub>11</sub>). We detected comparable increases in membrane-associated G<sub>q</sub> and G<sub>11</sub> G-proteins in BL and Ce amygdala of male rats that exhibited conditioned place preference for cocaine. In contrast, female rats withdrawn from cocaine exhibited neither enhanced function of 5-HT<sub>2A</sub> receptors in amygdala nor increased levels of membrane-associated G<sub>q</sub> and G<sub>11</sub> Gproteins in BL and Ce amygdala. In summary, our results in BL and Ce amygdala reveal unique gender differences in withdrawal-induced adaptive changes in 5-HT<sub>2A</sub> receptor signaling. These findings may be relevant to some of the gender different responses to drugs of abuse. Supported by USPHS DA13669 & DA07741

## **GENDER DIFFERENCES IN PSYCHIATRIC MULTIMORBIDITY AMONG ADOLESCENT SUBSTANCE USERS ADMITTED TO TREATMENT**

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**Background:** Substance users often reported suffering from multiple psychiatric disorders and were required sufficient mental health treatment in addition to their substance use problems. The purpose of this study is to investigate gender differences in prevalence and patterns of psychiatric multimorbidity among adolescent substance users in treatment. **Methods:** Study sample consisted of 1526 females and 4105 males, aged 12-18, who were treated in 101 substance abuse treatment programs in the United States. Measures assessing past 12-month psychiatric disorders via standardized interview with the Global Appraisal of Individual Needs (GAIN) were gathered at the entry of treatment. Multimorbidity was defined as an individual with two or more of the following co-occurring psychiatric disorders in the past 12 months: substance use disorders (SUD), internal mental distress disorders (major depressive disorder MDD, generalized anxiety disorder GAD, and traumatic distress disorder TSD), and external behavior disorders (attention deficit hyperactivity disorder ADHD and conduct disorder CD). **Results:** Female drug users were significantly more likely than male drug users to have MDD (Odds ratio OR=3.0, 95% CI=2.7-3.4), GAD (OR=2.2, 95% CI=1.9-2.5), TSD (OR=2.9, 95% CI=2.6-3.3), ADHD (OR=1.6, 95% CI=1.4-1.8), CD (OR=1.3, 95% CI=1.2-1.5) and to be diagnosed with substance dependence (OR=1.4, 95% CI=1.2-1.6). Females had significantly more diagnoses than males (3.3 vs. 2.5, t-test  $p < .001$ ) and were significantly more likely to have multimorbidity (78% vs. 65%,  $p < .001$ ) and to have diagnoses in each of the three areas of substance, internal and external disorders (50% vs. 31%,  $p < .001$ ). Cluster analysis identified four distinctive patterns of psychiatric disorders, with the percent of females in these groups varying significantly from 18% to 43%. **Conclusion:** Adolescents presenting to substance abuse treatment have a wide range of psychiatric disorders and that multimorbidity is the norm. Female drug users have different patterns of presenting diagnoses and multimorbidity as compared to male drug users.

## **DISCLOSURE OF SENSITIVE INFORMATION IN NON-TREATMENT-SEEKING POST-PARTUM WOMEN: A RANDOMIZED TRIAL OF FOUR APPROACHES TO PARTICIPANT PROTECTION**

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Participant protection-both actual and perceived-is crucial in research involving stigmatized behaviors such as illicit drug use, particularly with non-treatment seeking and/or vulnerable individuals. Nearly all sensitive longitudinal research utilizes a single secure table linking identifying information and data, often with the addition of a Federal Certificate of Confidentiality (COC); quasi-anonymous approaches, in which there is no link between name and data, have also been proposed. However, the relative effect of these procedures on disclosure is largely unknown. This study compared disclosure of sensitive information under four different consent conditions: secure linking table only, secure linking table plus COC, quasi-anonymous, and fully anonymous. A total of 200 urban post-partum women were randomly assigned to each condition and completed a battery of questions tapping sensitive content areas such as illicit drug use, sexual behavior, child abuse, and intimate partner violence. The primary outcomes were a summary score representing frequency of endorsement across all sensitive items, and a single visual analogue scale item measuring the extent to which participants believed their answers could be traced to them. Analyses showed that (a) the COC and both anonymous conditions yielded more disclosure than the linking table only condition (overall  $F [3, 194] = 7.8, p < .001$ ), and (b) participants perceived the anonymous conditions as providing greater protection from name-data connection than the confidential conditions (overall  $F [3, 194] = 32.6, p < .001$ ). These results suggest that anonymous approaches should be considered first in cross-sectional studies of stigmatized behavior. For longitudinal studies, these results suggest that while

COC's do facilitate disclosure of some sensitive information, quasi-anonymous approaches perform at least as well in that regard. Given the greater actual and perceived protection provided by the quasi-anonymous approach, further research into its use and relative advantages/disadvantages appears warranted.

## **A MULTI-COUNTRY STUDY OF 'NON-DEPENDENT ALCOHOL ABUSE: MALE-FEMALE DIFFERENCES AND OTHER EPIDEMIOLOGICAL PATTERNS**

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**AIMS:** This report presents original estimates from multiple countries now participating in the World Health Organization World Mental Health 2000 survey initiative (WMH2000) with respect to male-female differences and other epidemiological patterns of variation in the occurrence of 4 clinical features of nondependent alcohol abuse. In male-female contrasts, frequency of drinking is taken into account. **METHODS:** The estimates are from large-sample epidemiological data, all based upon a standardized multi-site sampling, assessment, and analysis protocol for epidemiological survey research. To date, the 14 countries reporting data are: United States, Mexico, Colombia, Netherlands, Belgium, France, Spain, Italy, Germany, Ukraine, Japan, Lebanon, Nigeria, and China (Beijing and Shanghai). Analysis methods are used to take sampling weights and complex survey design into account. **RESULTS:** Clinical features of nondependent alcohol abuse were more prevalent among men as compared to women in all countries under study, irrespective of drinking level, although some of these comparisons are not statistically robust due to smaller numbers of female drinkers. In many (but not all) countries, taking risky actions right after drinking (driving a car, operating a machine, riding a bicycle) was most prevalent among these clinical features. In other countries, the more prominent clinical feature was job difficulty due to drinking. As expected, occurrence of these clinical features of nondependent alcohol abuse was greater at higher frequencies of drinking. **CONCLUSIONS:** On the strength of the standardized multi-site protocol, the WMH estimates extend prior evidence based upon cross-national comparisons of per capita beverage alcohol sales and other indirect indicators of alcohol problems. Notwithstanding limitations, these epidemiological estimates help confirm the general pattern of male excess in the occurrence of these drinking problems. **SUPPORT:** NIDA K05DA015799, R01DA016558, U01MH060220, & an MSU research award.

## **GENDER DIFFERENCES IN MOTIVATIONAL AND VALUATIONAL PROCESSING OF VISUAL-REWARDING STIMULI: IMPLICATIONS FOR INCREASED PROPENSITY TO DRUG DEPENDENCE**

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Incentive motivation theory posits that craving is mediated by drug-induced changes in mesolimbic dopaminergic circuitry underlying motivational, rather than valuational aspects of reward. Given earlier reports of significantly heightened levels of craving in drug dependent females, it is plausible that neural systems subserving incentive/motivational function could be sexually dimorphic. To address this question, healthy male (N=17; age: 28.7±8.7) and female (N=16; age: 24.9±3.4) participants were administered two tasks assessing motivational and valuational reward functions, respectively, including: (a) key pressing to change the viewing time of average or beautiful female or male facial images, and (b) rating the attractiveness of these images. The results for the keypress task showed a significant effect of face type ( $p < 0.01$ ) along with significant face type by group (i.e., males and females) interaction ( $p < 0.01$ ). No significant group effect was detected indicating that total number of keypresses did not differ between the groups. The results of the rating task qualitatively paralleled those for the keypresses. Post-hoc analyses revealed that females expended effort to increase the duration of viewing of both attractive males' (53.3±179.9) and attractive females' (36.8±146.6) images. Males expended more effort to extend the viewing time of the beautiful female faces only ( $P < 0.01$ ); the magnitude of this effort significantly exceeded that of females. Keypress responses correlated with the attractiveness rating in the male ( $p = 0.02$ ), but not in the female group ( $p = 0.2$ ). These data suggest gender-related difference within and across the categories of the facial stimuli as well as potential dissociability of motivational and valuational reward processes in females. As female sex hormones are purported to modulate mesolimbic dopaminergic systems, further studies will be needed to investigate possible mechanisms of the observed differences, and their role in the propensity to develop drug dependence.

## **PHYSIOLOGICAL, SUBJECTIVE AND HORMONAL RESPONSES TO ACUTE PSYCHOLOGICAL STRESS: EFFECTS OF SEX AND SMOKING STATUS**

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Psychological stress plays an important role in the development of psychopathologies, including substance dependence. One way that acute stress can affect drug-taking behaviour is by directly altering physiological and/or subjective effects of drugs. This study was designed to characterize the timecourse of responses to acute stress in men and women and in smokers and nonsmokers. We measured physiological, psychological and hormonal responses to the Trier Social Stress Test in male smokers and non-smokers, and in female non-smokers in two phases of the menstrual cycle. Volunteers (N=66) participated in two sessions, one with stress and the other without stress. Heart rate, blood pressure, subjective ratings and plasma hormones were measured before and at repeated times during each condition. In all participants, stress increased heart rate, cortisol, progesterone, and ratings of negative mood (e.g. anxiety, jitteriness), and decreased ratings of positive mood (e.g. calm, relaxed, positive mood). The effects of stress were similar between male smokers and non-smokers, except that smokers exhibited prolonged heart rate responses and blunted cortisol responses. Male and female non-smokers differed in their physiological responses to stress. Male participants showed greater cardiovascular reactivity (heart rate, systolic blood pressure) and higher levels of cortisol after the stress and no stress conditions than females in either phase. These findings indicate that the effects of acute stress depend on the smoking status and sex of the individual, and suggest that stress-drug interactions may also depend on individual characteristics. Levels of other plasma hormones (ACTH, allopregnanolone, testosterone, catecholamines) will be examined and correlated with alterations in mood. This research was supported by DA02812 and M01RR00055.

## **CHARACTERIZATION OF INDIVIDUALS WHO ABUSE PRESCRIPTION OPIOID ANALGESICS OR HEROIN**

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In prior risk-management programs for prescription opioid analgesic abuse, we provided evidence of a substantial increase in the abuse of nearly all prescribed opioid analgesics, notably extended release (ER) oxycodone and hydrocodone products, over the past decade. While abuse is prevalent nationwide, it seems to be heavily localized in rural, suburban and small urban areas. The purpose of the present studies was to take the next step following abuse detection and localization: identifying the characteristics of the expanding pool of prescription drug abusers so that intervention strategies can be developed to reduce or “manage” the risk of abuse. Detailed questionnaires were filled out by a sample of over 1,000 subjects drawn from regions where prescription opioid analgesic abuse was disproportionately represented. The results revealed the following: first, the age distributions suggest overall that both male and female prescription opioid abusers are much older than those who use illicit drugs; second, within the subject pool there are gender differences in age (females > males) and other patterns of use/abuse, such as source of drugs (use of doctor prescriptions: females > males); third, 78% of the total sample was white, relatively well educated and employed; fourth, 40% of the subjects reported that they receive their drugs from a physician, suggesting either a legitimate prescription for pain, doctor-shopping, scamming or ill-informed doctors; fifth, we have strong evidence that pain may be an important co-morbid factor in prescription opioid abuse; sixth, iatrogenic (i.e., therapeutically induced) dependence may be a major factor in the abuse of prescription drugs; and finally, prescription drug abuse may serve as a “gateway” leading to abuse of heroin.

## **TRANSFERRING FROM HIGH DOSES OF METHADONE TO BUPRENORPHINE: A RANDOMISED TRIAL OF THREE DIFFERENT BUPRENORPHINE SCHEDULES**

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Transferring from high doses of methadone to buprenorphine can precipitate severe opiate withdrawal symptoms, posing a dilemma for people on high doses of methadone considering alternative treatment options. We examined the severity of opiate withdrawal associated with three approaches to transferring



from methadone doses between 40 and 100mg commencing with either 0.8mg, 4mg or 32mg buprenorphine and increasing to 32mg daily. Thirty participants were admitted to a residential detoxification unit and randomly allocated to one of the three different treatment approaches. All participants waited at least 2 days before commencing buprenorphine. Overall withdrawal symptoms were mild and only three patients did not complete the transfer. Higher methadone doses, a shorter time period between methadone and buprenorphine and female sex were associated with more severe withdrawal. The low and high buprenorphine dose schedules resulted in less opiate withdrawal. There were also differences in the pattern of opiate withdrawal following buprenorphine with the low dose group having less withdrawal following the first dose of buprenorphine and the high dose group having the shortest duration of opiate withdrawal. When taking withdrawal features, medication use and drop out into consideration, low doses and high doses appear to result in better outcomes than doses in between. Participants were followed up for three months post transfer, at which time 18 patients were still taking buprenorphine. Overall, heroin use reduced and quality of life improved significantly as a result of the transfer, particularly in those who chose to remain on buprenorphine or cease opioid substitution treatment completely.

### **SELF-REPORT AND BEHAVIORAL MEASURES OF IMPULSIVITY IN LIGHT AND MODERATE FEMALE DRINKERS**

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Alcohol use disorders among women are a significant problem in the U.S. Impulsivity is a factor shown to be involved in alcohol abuse in men, but there is little research to date examining the role of impulsivity in alcohol use in women. Thus, the present study examined light and moderate female drinkers on various self-report and behavioral measures of impulsivity. To date, 15 light drinkers (mean of 2 drinks/week) and 22 moderate drinkers (mean of 15 drinks/week) have completed the study. None of these women met criteria for alcohol abuse or dependence. Participants completed three self-report measures of impulsivity, and were then given 14 days of daily rating forms. The daily rating forms allowed us to assess various aspects of mood and prospectively measured alcohol consumption. Three weeks after the initial visit, participants returned to the laboratory and completed three behavioral measures of impulsivity. Moderate drinkers scored significantly higher on several self-report measures of impulsivity, including the Non-Planning subscale of the Barratt Impulsiveness Scale, the Impulsiveness subscale of Eysenck Impulsivity Questionnaire, and both the Disinhibition and General subscales of the Zuckerman Sensation-Seeking Scale. Moderate drinkers scored significantly higher on a behavioral measure of impulsivity, the Delay Discounting Task, than light drinkers: moderate drinkers chose smaller immediate rewards more than larger delayed rewards compared to light drinkers. There were no significant differences between moderate drinkers and light drinkers on two other behavioral measures of impulsivity (the Immediate/Delayed Memory Task and the Go Stop Task). Together, the results suggest that female moderate drinkers are more impulsive than female light drinkers. Ultimately, these data could contribute to a greater understanding of factors that are associated with, and perhaps predict, increased risk for drug or alcohol abuse in women. Supported by NIDA grant DA009114.

### **SMOKING OUTCOME EXPECTANCIES PREDICT NICOTINE WITHDRAWAL SYMPTOMS IN MILDLY AND MODERATELY DEPRESSED COLLEGE WOMEN SMOKERS**

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Twenty-one female college student smokers participated in the present study, which was conducted to examine the relation among nicotine withdrawal symptoms, depression, and smoking outcome expectancies in smokers. Participants were assessed at baseline for carbon monoxide (CO) level and salivary cotinine (ng/ml) to verify self-reported smoking status. They then completed a smoking history form, the Fagerström Test for Nicotine Dependence (FTND), the Smoking Consequences Questionnaire (SCQ), and the Beck Depression Inventory-II (BDI-II). Participants monitored nicotine withdrawal symptoms using the Smoking Withdrawal Questionnaire (SWQ) over the subsequent week as they attempted to abstain from smoking and returned to the lab each day for CO readings. Participant characteristics were: age ( $m = 21$  years), smoking rate ( $m = 20$  cigs/day), years smoking ( $m = 5.3$ ), FTND ( $m = 4.3$ ). Twelve participants' BDI-II scores were  $> 10$ , indicating at least half of the sample was mildly depressed. Five participants' BDI-II scores were  $> 23$ , indicating moderate to severe depression. Baseline Negative

Reinforcement/Negative Affect Reduction outcome expectancies were associated with nicotine withdrawal symptoms related to mood and alertness/fatigue among those women meeting diagnostic criteria for mild or moderate depression. Possible mechanisms and the implications of these findings for cessation treatment strategies will be discussed.

### **GENDER DIFFERENCES IN THE EXPERIENCE OF SPONTANEOUS CANNABIS QUITTING**

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Cannabis is the most widely used illicit drug in the world. Epidemiologic evidence suggests that many cannabis users attempt to stop use without formal treatment. There are few data on the experience of spontaneous quitting in adults, especially regarding the effect of gender, which has been shown to influence the acute effects of cannabis. This study examined gender differences in retrospectively self-reported characteristics of spontaneous cannabis quitting among 81 male and 23 female, non-treatment-seeking, adult cannabis smokers (52% white, 40% African-American, mean [SD] age 35 [11.3] years, 19 [10.1] years of cannabis use, 16.6 [3.9] years old at first cannabis use, 3.9 [10.2] lifetime quit attempts) who reported at least one "serious quit attempt" (self-defined). There were no significant gender differences in sociodemographic characteristics, cannabis use history, or quitting strategies. Women were significantly more likely than men to quit cannabis use due to concerns about health (78% v. 54%), productivity (78% v. 48%), energy level (78% v. 51%), and a desire to not burn holes in clothes or furniture (30% v. 11%); to resume use to relieve dysphoria (26% v. 9%), or due to the ending of a constraint against use (26% v. 6%); and to report upset stomach as a withdrawal symptom (17% v. 2%). Men were significantly more likely to quit due to displeasure from another (27% v. 0%); and to report marijuana craving (72% v. 48%) and an increased sex drive (23% v. 4%) as withdrawal symptoms. Both men and women initiated or increased use of legal substances during their quit attempt, but did not initiate new illegal drug use. These findings highlight important gender differences in spontaneous quitting of cannabis use that suggest the need for differential treatment approaches. Supported by the Intramural Research Program of the National Institutes of Health, National Institute on Drug Abuse and NIH grant RO-1 DA03018.

### **SEX (TRADING) IN THE CITY: PRACTICES AND BELIEFS AMONG FEMALE CRACK/COCAINE SEX TRADERS**

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Although detailed histories of sexual behaviors have been collected in prevention studies, they are not usually examined thoroughly. A NIDA-funded study to reduce HIV behaviors among 445 crack/cocaine using women in St. Louis obtained detailed sexual histories, including types and number of sex acts, with and without protection. Overall, women averaged 54 acts over a 4 month period with 26% protected. Vaginal sex was the most commonly reported (mean=33), comprising 69% of all sex with 31% protected. Performed oral sex was reported 9 times in the 4 month period (12% of total) while received oral sex averaged 12 times (17% of total). Performed oral sex was protected 12% of the time, but only 4% for received oral sex. Anal sex was rare (1%). 87% of women who reported having all 3 types of sex were sex traders. Sex traders also reported a higher number of sex acts than non-sex traders (62 vs 43). Vaginal sex, in relation to all sex, was reported less among sex traders than non-sex traders (62% vs 80%); traders used more protection than non-traders for vaginal sex (35% vs 25%). Sex traders performed oral sex more often than non-sex traders (13 vs 3 sex acts); in contrast to vaginal sex, oral sex was performed proportionally more among sex traders compared to non-sex traders (17% vs 5% of all sex). Sex traders were more likely to report protection when performing oral sex compared to non-sex traders (16% vs 5%). There were no differences in the amount of oral sex received or anal sex between the two groups. While sex traders may report higher rates of protection, the rates are abysmal. Additionally, traders compared to non-traders have faulty health perceptions in that they report washing their own or their partners' genitals before sex with soap and alcohol, substituting oral for vaginal sex, using earwax to determine presence of STDs, and having sex "only with healthy looking people". Finally, they report that they have no sex behaviors to change. What can we, as prevention specialists, do to improve our prevention messages? These, and other issues, will be discussed.

## **WOMEN'S ALCOHOL CRAVING AND SYMPTOMS IN EARLY RECOVERY**

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**Objective:** This descriptive longitudinal study examined the relationship between physical and psychological symptoms and alcohol craving reported by women during their 2nd, 3rd and 4th months of recovery. **Method:** Alcohol dependent women (n=16) with a goal of abstinence from drugs and alcohol were recruited from the community. They reported craving, depression and symptoms of psychophysiologic activation weekly for 12 weeks based on obsession items from the Obsessive Compulsive Drinking Scale (OCDS), the Beck Depression Inventory (BDI) and the Symptoms of Stress Inventory (SOS) respectively. Women also reported weekly use of alcohol, nicotine, psychoactive drugs and prescription medications. In the analysis, two groups emerged: Abstainers (n=10) who used no alcohol or drugs across time and Relapsers (n=5) who used substances intermittently. The analysis focused on 1) the association of craving and depression using correlations 2) differences in craving pre and post relapse using t-tests and 3) patterns of symptoms and craving across time using intercept, slope and R<sup>2</sup>. **Results:** OCDS scores ranged from 0 to 24 and BDI scores from 0 to 38. Significant correlations were observed between the BDI and OCDS scores averaged across weeks 10-12 ( $r=.56$ ), but not across weeks 1-3. The OCDS scores for the relapse week and the week following relapse ( $M=8.50$ ,  $SD=3.08$ ) were significantly higher than those 2 weeks prior to relapse ( $M=5.63$ ,  $SD=3.42$ ) ( $t=5.19$ ,  $p=.014$ ). The pattern of change revealed a linear decrease in SOS scores for Abstainers ( $R^2=.45$ ), but not for Relapsers ( $R^2=.12$ ). Four of the 5 Relapsers used prescribed medications (narcotics, tranquilizers or sedatives) immediately prior to relapse. **Conclusions:** The significant association between depression and craving and the rise in craving with relapse are consistent with literature linking depression and craving to CNS dysregulation from substance abuse. They highlight the importance of managing depression and promoting abstinence in alcohol dependent women in early recovery. This study was supported in part by NIDA grant T32 DA07257, Sigma Theta Tau and the Hester McLaws fund.

## **WEIGHT GAIN FOLLOWING SMOKING CESSATION AMONG FEMALE PRISONERS**

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Concerns of weight gain among female smokers are high and some women use smoking to control weight. The impact of weight on smoking cessation has not been investigated with female inmates during a smoking cessation intervention, even though it is estimated that 80% of women smoke in prison. This study was a randomized controlled trial to determine changes in weight during a group smoking cessation intervention with female prisoners (10-week group intervention combined with NicoDerm CQ). 147 participants signed informed consent and had complete weight data at 3 month follow-up; 113 intervention and 94 controls were compared for weight change over three and six months. The sample was evenly split between Caucasians (47.2%) and African Americans (43.8%) with most women having a high school degree/GED or higher education (70.6%). The average age was 33.1 years ( $SD = 8.6$ ) and most participants had never been married (45.8%) or were divorced (30.6%). Both groups lost weight over three and six months, however controls had lost significantly more weight compared to intervention participants at 3 months (-4.1 lbs vs. -1.1 lbs;  $p=.014$ ) and 6 months (-6.7 lbs vs. -2.7 lbs;  $p=.067$ ). At 3 months, 30% of participants in the intervention group had quit smoking. Participants who completed the intervention and quit smoking were compared to participants who continued smoking for weight change at 3 months. Participants who continued to smoke had lost weight while participants who quit smoking had gained weight (-2.0 lbs vs. 0.8 lbs;  $p=.058$ ). By six months, 18% of participants had quit smoking. Participants who continued smoking had lost weight while participants who quit smoking had gained (-4.8 lbs vs. 5.4 lbs,  $p=.011$ ). These findings support previous studies from smokers in the general population that indicate modest weight gain following smoking cessation. Future studies should focus on combining weight control strategies with smoking cessation in a female prisoner population for optimal health benefits.

## **SUBSTANCE USE DURING PREGNANCY IN WEST CENTRAL MEXICO**

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Substance use has increased among women in Mexico. However there is no reliable data about substance use and abuse during pregnancy, which comprises a very high interest group of patients (mother and child). As a first approach we looked at the hospital records of the largest General Hospital in the state and region (Hospital Civil de Guadalajara) and reviewed the statistics for 15,789 pregnant women who gave birth during the year 2004. Only 432 out of 15789 pregnant women reported to have used any kind of substance of abuse: 83 % smoked tobacco, 26 % used alcohol and 16.9 % used illegal drugs. Mean age was 25 years and the majority who were using some kind of substance were from low educational and economic status. Among the latter highest frequency was seen among single mothers. Alcohol use was highest among housewives with low or no education. We assume there is much under-registered information about substance use in our records. We hypothesize that mothers with low educational level do not worry much about the use of substances as they ignore the harm those produce, particularly in the fetus. Our second hypothesis is that pregnant women who continue using a substance during pregnancy may have a strong dependence limiting their abstinence. There should be preventive campaigns aiming to target the group depicted here. We plan to conduct a prospective survey with cohorts of unpregnant women with substance use with high chances to conceive and get pregnant.

## **RISK FOR OPIOID ABUSE/DEPENDENCE IN NON-MEDICAL PRESCRIPTION OPIOID USERS: EVALUATING THE ROLE OF GENDER**

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The transition to prescription opioid abuse/dependence (POD) in non-medical users of prescription opioids is relevant to prevention and treatment. We analyzed the 2003 National Survey on Drug Use and Health, restricting our analysis to those reporting past year non-medical use of prescription opioids (NMUPO). We determined the association of specific demographic and clinical characteristics with POD using a multivariable logistic regression model and then stratified the model by gender. 4136/55230 (7.5%) of the respondents reported past year NMUPO; age range 12-80, 48% women, 73% white, 66% had > 12th grade education, 50% consistent past year employed, 32% consistent past year insured, 18% reported mental illness. Past year prevalences: 61% cigarette use, 57% alcohol use, 28% alcohol abuse/dependence, 53% illicit drug use/abuse/dependence, 28% sedative use/abuse/dependence, and 13% stimulant use/abuse/dependence; and lifetime prevalences of use: 60% hydrocodone, 38% oxycodone, and 15% oxycontin. On multivariable analysis, characteristics associated with POD: younger age (12-17 years) (OR 2.26; 1.36-3.75), uninsured in the past year (OR 1.86; 1.14-3.02), mental illness (OR 1.90; 1.30 -2.78), past year sedative use/abuse/dependence (OR 1.75; 1.18-2.61), ever used oxycodone (OR 1.67; 1.14-2.46), ever used oxycontin (OR 2.62; 1.73 -3.96), and no past year alcohol use (OR 4.51; 2.38-8.55). By gender, the risk for past year POD was present in women, but not in men, with mental illness (OR 2.32; 1.33-4.08), past year sedative use/abuse/dependence (OR 2.22; 1.27 -3.88), and early age (1-11 years) initiation of illicit drugs (OR 4.48; 1.51 -13.27). Among those with past year NMUPO, the risk for POD is greatest in those who are younger, without consistent insurance, with mental illness, with past year sedative use/abuse/dependence, ever used oxycodone products, and without past year alcohol use. In women, there is increased risk with early initiation of illicit drugs. These factors should influence screening, prescribing and treatment efforts designed to decrease the impact of POD.

## **EARLY ADOLESCENT THC ALTERS BEHAVIOR IN AVOIDANCE PARADIGMS IN SEX-SPECIFIC WAYS**

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Marijuana is the most widely used abuse drug in the US today. Tetrahydrocannabinol (THC), the major active constituent of marijuana, has been found to alter several types of behaviors including cognitive behaviors. We hypothesized that THC administered during a time when the brain was developing would produce long-term alterations in behaviors which rely on the hippocampus, a brain region known to contain cannabinoid receptors. Therefore, we dosed Sprague-Dawley rats with 0, 1 or 5 mg/kg THC during postnatal days 22-40, a time equivalent to early adolescence and tested behavior in adulthood. At 60+ days, we conducted Active Place Avoidance testing, at 132+ days, passive avoidance testing and at 140+

days, active avoidance testing. Results show that at 60 days, while both doses of THC improved performance in the active place avoidance paradigm, the learning curves were different for male and female rats. There were no effects of THC on latency to cross to dark compartment on test day for passive avoidance. However in active avoidance, control females showed a greater percentage of avoidances compared to THC-treated females while in males, the high dose THC group performed better than the other groups. These data suggest that a brief exposure to THC during early adolescence has lasting effects on avoidance learning that vary depending on the sex of the subject and the testing modality utilized.

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## **MAJOR DEPRESSION: CONTRIBUTIONS OF GENDER, MDMA AND CANNABIS USE**

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Several studies have reported an association between MDMA (ecstasy) use and increased rates of depressive symptomatology. However, MDMA users tend also to use other illicit drugs, and some evidence suggests that depressive symptoms in MDMA-only users are not elevated relative to poly-drug users. Therefore, it is possible that MDMA use alone does not account for the increased levels of depression observed in heavy users of MDMA. Recent research has focused on comorbid cannabis use as a potential confound in studies of MDMA use and mood. To date, studies of MDMA use and depression have relied almost exclusively on rating scales of depressive symptomatology rather than clinical diagnoses. This study aimed to examine the associations among MDMA use, cannabis use and a DSM-IV diagnosis of lifetime Major Depressive Disorder (MDD) in young adult MDMA users. A total of 229 (80 female, 149 male; mean age =  $23.1 \pm 4.2$  yrs) MDMA users (mean use episodes = 36.0 times,  $\pm 46.3$ , range = 2 to 400) underwent a semi-structured psychiatric interview (SCID) and completed a detailed drug history questionnaire. Results indicated that individuals who met DSM-IV criteria for MDD (current or past) did not differ in ecstasy use relative to those without such a diagnosis. In addition, whereas gender was not associated with a diagnosis of MDD, lifetime diagnosis of Cannabis Abuse or Dependence was significantly associated with an increased rate of lifetime MDD diagnoses. Finally, results of logistic regression indicated that neither gender nor mean number of MDMA episodes were significant predictors of a diagnosis of lifetime MDD, but meeting DSM-IV criteria for a cannabis use disorder was a significant predictor for also being diagnosed with MDD. These results indicate that comorbid cannabis abuse accounts for a greater proportion of the variance in the diagnosis of MDD compared to MDMA use, and underscore the importance of controlling for polydrug use, especially marijuana, in studies of the effects of MDMA use on mood function. Supported by Grant DA14874 and from Joe Young, Sr. funds from the State of Michigan.

## **ESTROUS CYCLE AND HORMONAL INFLUENCES ON COCAINE-PRIMED REINSTATEMENT OF DRUG SEEKING IN 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 and enhanced cocaine-primed reinstatement of drug-seeking than male rats. This latter effect is estrous cycle dependent, as estrus females show greater cocaine-primed reinstatement than nonestrus females. However, the relationship between estrogen and progesterone levels with cocaine self-administration and reinstatement has not been explored. The current study examined whether responding during cocaine self-administration and cocaine-primed reinstatement would correlate with estrogen and progesterone plasma levels. Female, Sprague-Dawley rats ( $n = 27$ ) were trained to lever press on a FR1 schedule for i.v. cocaine (0.5 mg/kg/infusion) 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 (5 or 10 mg/kg, IP) or saline 30 min prior to reinstatement testing. Vaginal smears and blood samples were collected prior to and during chronic cocaine self-administration and prior to each reinstatement test. Although no significant differences were found during self-administration, there was a significant increase in responding during cocaine-primed reinstatement for estrus versus nonestrus females. Moreover, these effects appear to be inversely related to hormone levels, as proestrus females (high plasma levels of estrogen and progesterone) exhibited less responding during reinstatement, while estrus females (lowest plasma levels of estrogen and progesterone) showed the greatest reinstatement. Taken together,

these results suggest that while estrogen and progesterone levels do not appear to influence ongoing cocaine self-administration, lower hormone levels may contribute to increased susceptibility to relapse. (Supported by NIH Grant DA016511).

### **RANDOMIZED TRIAL OF BACLOFEN FOR SMOKING REDUCTION**

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Indirectly dampening the mesolimbic dopamine system with a GABA B agonist may be a useful strategy to reduce craving and drug use. Because it is FDA-approved and well-tolerated, we chose the GABA B agonist baclofen, to test this hypothesis. We conducted a planned interim analysis of our ongoing Smoking Reduction Study at N=58 subjects (27 Females/31 Males) to examine preliminary clinical outcomes. Treatment-seeking smokers were randomized to either baclofen (20 mg q.i.d.) or placebo. Twenty-nine subjects completed the study with no significant differences between groups in attrition or side effects. Groups were also not different in age (40.5 yrs), education (14.5 yrs), cigarettes smoked per day (21 CPD), or depression as measured by the Beck Depression Index (5.1). All subjects received equivalent minimal smoking cessation counseling. Counseling was administered by a trained technician and guided by a manual ("You Can Quit" adapted from the U.S. Depart. Of Health and Human Services Guide). Repeated measures analysis of CPD over the nine week study showed a strong trend toward greater decreases in smoking in the baclofen group compared to the placebo group [ $F(1, 213)=5.97$ ,  $P=0.06$ ]. Because smoking reduction is a first step in quitting smoking, this ongoing study suggests that ultimately, baclofen may be helpful for cessation. Upon study completion, we will examine results for possible male/female differences as the literature suggests that baclofen may be more helpful for females. A subset of these subjects were imaged (prior to and during treatment) with continuous arterial spin-labeled (CASL) perfusion fMRI during exposure to smoking and nonsmoking cues. These ongoing adjunctive studies will enable us to link medication response to brain substrates, with the prediction that baclofen will dampen limbic perfusion (amygdalae, insulae, ventral striatum) reported in smokers during exposure to cigarette cues (Franklin, SfN 2005). Supported by: NIDA KO1 DA-015426, P60 DA-05186, R01 DA10241; VA VISN 4 MIRECC; and Alexander Foundation.

### **A GENDER PERSPECTIVE ON VIOLENT BEHAVIORS IN COCAINE ADDICTS**

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The purpose of this study is to establish a practical and theoretical basis for the prevention of violent behaviour among males and females with a diagnosis of cocaine addiction. Qualitative methodology was used. With the objective of determining which dimensions would be evaluated in the first stage of the study, 6 in-depth interviews with drug abuse professionals were conducted. In the second stage, and drawing from the results of these interviews, a semistructured interview was developed which included three areas: cocaine and violence; drug abuse treatment; and violence and treatment. The interview was administered to a representative sample (N=30), of professionals working in public outpatient treatment centres (Unidades de Conductas Adictivas (UCA's)). A Grounded Theory based data analysis was conducted. Which revealed a relation between cocaine abuse and violent behaviours and differed between males and females. Men tended to be violent with their partners, and women tended to be violent with their children. The type of violence differs by gender; men tended to be more violent in frequency and intensity. Male tend to have more support networks than women when they request treatment. Men go into treatment because they have pressure from external factors. Women usually start treatment because of internal reasons. Women who request treatment are usually victims of domestic violence. Professionals need specific training to deal better with addicts' violent behaviours in the treatment process. This study indicates that cocaine users' violent behaviours may vary by gender. It is important to investigate in depth those differences in order to improve the quality and outcomes of treatment programs. Supported by Conselleria d'Empresa, Universitat I Ciència.GV05/279 Direcció General d'Investigació I Transferència Tecnològica.CSISP, Direcció General de Salut Pública, Conselleria de Sanitat,G.V.

## **PREVALENCE AND RELATIONSHIP OF OVERWEIGHT AND OBESITY AMONG MEN AND WOMEN IN A LONG-TERM RESIDENTIAL SUBSTANCE ABUSE TREATMENT PROGRAM**

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The purpose of this retrospective chart review was to examine the correlation between length of time abstinent from alcohol and drugs and weight changes among patients in long-term residential treatment for substance abuse. A random sample was generated to have equal numbers of men and women (males= 65; females=65) who entered the facility between January 1, 2002 and December 31, 2002. Of the 130 cases, 99 (76.2%) dropped out (did not complete one year of treatment) and 31 (23.8%) persisted (completed one year of treatment). The mean initial BMI for the total sample was 27.03 (26.83 for men, 27.23 for women). The mean initial BMI for dropouts was not statistically different than for persisters (26.93 versus 27.33). There was a significant increase in body mass index among patients who completed one year of treatment (paired  $t=3.2$ ;  $p<.001$ ); 57.7% of persisters were at least overweight at the end of one year, with 27% being obese or morbidly obese. The mean BMI for persisters was 29.24, with an average increase of 1.91 BMI points. Although the mean BMI change for women was greater than for men (2.05 compared to 1.8 BMI points), it was not statistically significant. An increase in BMI was not correlated with drug of choice. Given the results of this study, and the problems associated with both obesity and substance abuse, further study of the relationship between abstinence from alcohol and drugs and weight gain is warranted.

## **PREDICTORS OF RETURN-TO-PRISON FOLLOWING COMMUNITY TREATMENT FOR SUBSTANCE-ABUSING FEMALE OFFENDERS**

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Hypothesis: Female offenders with substance abuse problems are at high risk for relapse and recidivism after leaving prison. We hypothesized that participation in an aftercare program, the Female Offender Treatment and Employment Project (FOTEP), would reduce the risk of return-to-prison. The program provides community-based substance abuse treatment to women parolees for 6 to 15 months following their release from prison in California, using a therapeutic community approach. Procedures: Return-to-prison (RTP) was examined over periods of 12 months (N = 2,654), 24 months (N = 1,915), 36 months (N = 1,078), and 48 months (N = 406) following exit from FOTEP. All data on participants was based on administrative and program records. Statistical analyses: Survival analyses were conducted to determine the predictors of RTP. Results: Overall, RTP rates were: 33% at 12 months; 46% at 24 months, 50% at 36 months, and 54% at 48 months. Individuals who completed the FOTEP program were less likely to RTP, with hazard ratios (HR) ranging from 0.29 at 12 months to 0.34 at 48 months (all HR,  $p < .0001$ ). Individuals who were classified as having a co-occurring mental disorder were more likely to RTP, with HRs ranging from 2.3 at 12 months to 3.8 at 48 months (all HR,  $p < .0001$ ). Individuals convicted of a felony were more likely to RTP compared to civil addicts who were mandated to treatment; HR at 12 months = 1.4 ( $p < .01$ ); HR at 48 months = 2.1 ( $p < .05$ ). In addition, each year increase in age reduced the risk of RTP by 2%. Ethnicity was also associated with RTP, with African Americans having approximately 37% greater risk of RTP at 12 months and 68% at 48 months. Conclusion: Although risk of returning to prison following community-based substance abuse treatment for female offenders remains high, the risk is considerably reduced among those who complete treatment; however, those with co-occurring mental disorders remain at particularly high risk. Supported by California Department of Corrections and Rehabilitation (Contract C03.052)

## **INDIVIDUAL AND SOCIAL FACTORS ASSOCIATED WITH DRUG TREATMENT PARTICIPATION**

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Background: Little is known about the interaction of individual and social factors in the role of drug treatment participation. Objectives: To assess whether different levels of addiction severity, problem use, plans to stop, and plans to control drug use combined with different levels of friends' encouraging treatment participation, drug buddies' discussing reducing drug use, getting free drugs from others and being encouraged to use drugs are associated with treatment participation among injecting and non-

injecting drug users in Baltimore City. Method: Data from the SHIELD Study (1996-2004; N=581) was analyzed using logistic regression models controlled for injecting drug use, gender and age. Multivariate adjusted odds ratios and 95% confidence intervals (aOR [95%CI]) are reported. Results: Participants who do not report problem use and do not talk very often with friends about reducing drug use (aOR=0.56 [0.35, 0.90]), and those who do not plan to stop using and do not get encouraged by friends to enter treatment (aOR=0.38 [0.22, 0.66]) are less likely to be in treatment. Those who have high addiction severity and whose friends talk very often about reducing drug use (aOR=2.4 [1.2, 4.7]) are more likely to be in treatment, and so are females (aOR=1.9 [1.3, 2.6]). Conclusion: Those with problem use or who plan to stop are equally likely to be in treatment regardless whether or not they get encouraged by friends to go to treatment. However, those with no problem use or who do not plan to stop, respectively, are just as likely as those with problem use or those who plan to stop (regardless of encouragement to enter treatment) to be in treatment if they are encouraged by friends to enter treatment. For those with high addiction severity, friends' talking about reducing drug use may be crucial to enter treatment. Depending on individual susceptibility, social influence is just as important as lack of thereof.

## **ATTACHMENT AND SOCIAL SUPPORT AMONG WOMEN DRUG OFFENDERS IN COMMUNITY TREATMENT**

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Recent evidence suggests that attachment and social support play important roles in mediating substance abuse (Caspers, et al., 2005; Suchman, et al., 2005; Miljkovitch, et al., 2005). Attachment theory (Ainsworth, Blehar, Waters, & Wall, 1978; Bowlby, 1988; Main, 1995) describes types of parent-child connections and their effects on the security of a child's attachment to a parent. There is also evidence that the strategies that adults rely on in their romantic attachments result primarily from their childhood attachment experiences (Fraley & Shaver, 2000; Shaver & Hazan, 1993) and that those who experienced disruptions in attachment during childhood have difficulties providing an environment for secure attachment for their children (Main & Hesse, 1990). Our current study involves women drug offenders in community treatment randomly assigned to treatment-as-usual and women-focused treatment. Instruments include: Experiences in Close Relationships Inventory, Adult Adolescent Parenting Inventory, ISAP social support scale, and the Brief Symptom Inventory. We hypothesize that women with secure adult attachments will have healthier parenting attitudes. In addition, we plan to examine the relationships among adult attachment, social support, and psychological functioning. Preliminary analysis of data on 42 subjects shows that subjects had a mean score of 1.60 (scale 0 to 4) on attachment avoidance and a mean score of 2.25 (scale 0 to 4) on attachment anxiety, greater than normative samples.

## **PREVALENCE AND CORRELATES OF SUBSTANCE USE DURING PREGNANCY: RESULTS FROM A NATIONAL SAMPLE**

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Background and Objective: Research demonstrates that substance use can have deleterious effects on pregnancy outcomes. The purpose of this study was to examine substance use during pregnancy in a nationally representative sample of women. Methods: Data from the 2002 and 2003 National Survey on Drug Use and Health (NSDUH) were utilized to determine the prevalence and correlates of substance use among pregnant women (N=1800) aged 15-44 years. Variables included demographics, substance use in the prior 30 days, severe mental illness (SMI) and severe stress in the prior 12 months. Since only pregnant women were included, unweighted contingency table and multiple logistic regression analyses were utilized. Results: Most respondents were between 18 and 34 years and married. The overall prevalence of past month illicit drug, cigarette and alcohol use was 4.7%, 18.9% and 10%, respectively. However, the prevalence of use decreased significantly ( $p<0.001$ ) in the second and third trimesters versus the first trimester. Compared with women not reporting use during pregnancy, substance users were significantly more likely to meet the criteria for SMI (Adjusted Odds Ratio [AOR]: 1.89, 95% Confidence Interval [CI]: 1.35, 2.66) and have experienced recent stress (AOR: 1.47, 95% CI: 1.09 – 1.97). In addition, those women who were employed and married were less likely to have used any substance during pregnancy, adjusting for age, race and income. Conclusions: Although there were significant reductions in drug use during pregnancy, women with severe mental illness, stress and less social support appear vulnerable to



continued use during pregnancy. Prevention and intervention programs aimed at these populations are warranted in order to reduce negative pregnancy outcomes associated with substance use.

### **MONTHLY PATTERNS OF SMOKING TOPOGRAPHY AND SMOKING RATE AMONG COLLEGE WOMEN SMOKERS: A PILOT STUDY**

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Smoking topography measures of nicotine self-administration (e.g., interpuff latency, puff volume, peak flow of puffs, puff duration) have been shown to vary with smoker characteristics such as mood state and nicotine dependency level. Animal and human studies have shown that drug self-administration patterns are associated with menstrual cycle phase in female animals and humans. The goal of the present ongoing study is to track smoking topography and nicotine self-administration patterns over time in women smokers. We hypothesize that these topographical patterns and daily smoking rate will fluctuate in a predictable monthly pattern, possibly in concert with menstrual cycle phase and hormonal fluctuation in women smokers. Participants are college undergraduate women who smoke > 10 cigarettes per day and are not taking oral contraceptives. To date, we have screened 132 women, and 17 of them have met the smoking and oral contraceptive inclusion/exclusion criteria. Eighty-eight percent of the participants are Caucasian and 12% are African-American. Participant age:  $m = 20.5$ , daily smoking rate:  $m = 16.2$ , number of years smoking:  $m = 4.4$ , nicotine dependence level, as measured by the Fagerström Test for Nicotine Dependence (FTND):  $m = 3.8$ , and carbon monoxide level:  $m = 20.3$  ppm. Participants were assessed with the smoking topography device at baseline and for a subsequent period of > 2 months, at twice weekly intervals. Participants also self-monitored their daily smoking rate. Eight participants have completed the study (topography and self-monitored smoking was obtained for > 2 months). Time to first puff, puff count, and average puff interval were significantly correlated with smoking rate on 4 days of each month. Visual inspection of individual graphs displaying smoking rate and topography data over 2+ months reveals a 7-14 day period of increased smoking.

### **TREATMENT FOR PTSD AND SUD: SITE DIFFERENCES AND IMPLICATIONS FOR OUTCOMES**

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Background and Methods: Posttraumatic stress disorder (PTSD) is prevalent in substance-dependent samples and associated with poor outcome. Here, we report baseline characteristics of the patient sample of a randomized, controlled, community-based, multisite trial in NIDA's Clinical Trials Network of Seeking Safety (SS), a 12-session group intervention for PTSD and substance abuse vs an attentional control, Women's Health Education (WHE). Patients meeting current DSM-IV criteria for drug or alcohol dependence and PTSD were eligible. All patients continued to receive treatment as usual at their respective programs. Results: 541 women with a history of trauma were screened, of whom 379 (70%) met eligibility criteria, and 353 (65%) were randomized (SS=176, WHE=177). The primary reason for exclusion was a lack of PTSD diagnosis. Randomized participants (N=353) had substantial substance use in the last month (45% use alcohol, 38% cocaine, and 25% marijuana) and reported an average of 10 lifetime drug treatment episodes. CAPS scores ( $M=56.4$ ) indicate a highly symptomatic sample with 80% meeting full DSM-IV criteria for PTSD. About half experience a chronic medical issue (45%), with multiple hospitalizations in the last month ( $M=3.0$ ), and multiple legal convictions ( $M=5.2$ ). Sites differed in types of substance used by patients ( $p < 0.001$  for alcohol, heroin, and cocaine), opiate dependence ( $p = .009$ ), PTSD severity (CAPS) ( $p < .001$ ), and measures of service utilization including mental health visits ( $p < .001$ ), 12-step meeting attendance ( $p < .001$ ), and lifetime treatment episodes ( $p < .001$ ). Sites with more severe participant substance use and PTSD utilized fewer outside services. Implications: Most individuals in treatment for substance use disorders who experience trauma meet current PTSD criteria with substantial distress, continue to use substances, and carry multiple dependence diagnoses. Study findings highlight the need for population specific treatment. Implications for interpretation of study outcomes given site differences are discussed.

## **A LONGITUDINAL STUDY OF PRE-SEXUAL RISK BEHAVIORS AND SUBSTANCE USE AMONG ADOLESCENTS WHOSE MOTHERS ARE HIV POSITIVE**

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The initiation of substance use and risky sexual behaviors during adolescence is often a precursor to long-term addiction to substances and HIV infection during adulthood. It is particularly important to examine these risk behaviors among adolescents of HIV+ mothers, as their mothers face the challenge of coping with their illness as well as mediating the impact of their illness upon their family. This longitudinal study examined the association of pre-sexual and sexual behaviors (intimate touching, oral sex, and sexual intercourse) with substance use, family life variables, religiosity, and attitudes towards women among adolescents of HIV-positive mothers. Participants were 118 predominantly Latino and African-American adolescents (mean age=14.0; SD=1.8 at 12-month follow-up) in Los Angeles County. Adolescents and their mothers were interviewed in person separately at baseline, 6-month and 12-month follow-up. Pre-sexual behaviors were examined over time in relation to predictor variables while adjusting for age and gender differences. Pre-sexual and sexual behaviors increased over time from 19% at baseline to 25% at 12-month follow-up. There were significant positive associations between adolescent pre-sexual behaviors and the following variables: adolescent tobacco, alcohol, and marijuana use; disengaged family style; and traditional attitudes towards women (e.g., belief in a more submissive role for women). Adolescents with higher scores on family routines and parental monitoring scales were less likely to engage in pre-sexual behaviors across the three assessment periods. Adolescent religiosity, mothers' health status, and mothers' use of drugs or alcohol were not associated with adolescent pre-sexual behaviors. These findings suggest that HIV+ mothers with strong parenting skills may effectively protect their adolescents from the early initiation of presexual and sexual behaviors. Implications are discussed. Funded by NIMH (R01MH057207) and NIDA (P30DA016383).

## **EARLY SMOKING STATUS PREDICTS SMOKING-CESSATION OUTCOMES IN PREGNANT WOMEN**

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Smoking during the initial two weeks of quitting predicts poor short- and longer-term outcomes in the general population of smokers. The present study examined whether that rule applies to pregnant women trying to quit smoking. Data were obtained from 129 women participating in clinical trials examining the efficacy of abstinence-contingent vs. non-contingent voucher-based reinforcement therapy. Smoking status was assessed in weeks 1 and 2 of the cessation effort and again at an end-of-pregnancy assessment at 32 weeks gestation using self-report and biochemical verification. In both conditions, any smoking in weeks 1 or 2 predicted a high likelihood of classification as a smoker at the end-of pregnancy assessment; that is, there was a 79% and 92% chance that those who smoked in weeks 1 or 2 would be classified as smokers at the end-of-pregnancy assessment in the contingent and non-contingent conditions, respectively. Among those who abstained in weeks 1 and 2, the chances of smoking at end-of-pregnancy were only 11% and 50% in the contingent and non-contingent voucher conditions, respectively. There was no evidence that the relationships between early and later smoking or abstinence differed significantly between the contingent and non-contingent treatment conditions, although the estimates regarding abstinence in the non-contingent condition were relatively variable related to the small number of subjects who successfully abstained in that condition. Overall, these results offer robust evidence affirming that the general rule regarding the negative predictive significance of early smoking to treatment outcome applies to pregnant women. The results also suggest that clinicians involved in helping pregnant smokers quit may want to monitor smoking status in the initial weeks of the cessation effort and consider enhancing/changing the intervention when smoking is detected.

## **PREDICTORS OF MARIJUANA USE AMONG MARRIED COUPLES: THE INFLUENCE OF ONE'S SPOUSE**

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Background: With the transition into marriage, marijuana and other substance use tends to decline. However, changes in marijuana use may not be the same for all individuals during this transition. The objective was to identify trajectories of marijuana use during the early years of marriage and to identify baseline factors that predict these trajectories. Methods: Couples (N = 634) marijuana use, other substance use, and psychological variables were assessed at the time they applied for their marriage license and then again at the first and second anniversaries. Discrete mixture models estimated trajectories of marijuana use. Multinomial logistic regression models identified baseline predictors of these trajectories. Results: A 2, 3, and 4 group trajectory models were evaluated. The 3 group model had the best fit for both men and women (stable high use group (High), stable low use group (Low), and a stable no use group (No)). Compared to men in the No group, men in the Low group drank more often and had wives who also used marijuana. Compared to men in the No group, men in the High group drank more frequently and at heavier levels and had wives who used marijuana and had greater levels of heavy drinking. Among wives, those in the Low group were more likely to be heavy drinkers compared to wives in the No group. Women in the High group were slightly more likely to report greater levels of anxiety ( $p = .08$ ) and depression ( $p = .06$ ), be smokers and have husbands who also used marijuana, compared to women in the stable No group. Although the impact of psychological variables was reduced in the multivariable models, strong bivariate relationship existed with marijuana use. Discussion: After controlling for one's own substance use and psychological factors, a spouse's use of marijuana was a strong predictor of marijuana use trajectories. (Supported by NIAAA grant R37-AA09922 awarded to KEL)

## **MENSTRUAL CYCLE PHASE EFFECTS ON NICOTINE WITHDRAWAL AND CIGARETTE CRAVING: A REVIEW**

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There is conflicting research on gender differences on the experience of withdrawal and craving and some have suggested that menstrual cycle effects may moderate this relationship. Given hormonal changes during the menstrual cycle, it is possible that abstinence-related symptoms such as withdrawal and craving vary as a function of menstrual phase as well. This review summarizes the modest but expanding body of research in this area. Thirteen studies were identified that examined menstrual phase effects on withdrawal and/or craving either under ad lib smoking, abstinence, or both. Of 8 study arms across 7 studies that included a condition of ad libitum smoking, there were significant menstrual phase effects for withdrawal in three study arms and for craving in three arms. Of 12 study arms across 10 studies involving abstinence, there were significant menstrual phase effects for withdrawal in four study arms and for craving in five arms. One of the challenges inherent in interpreting this literature is that it is difficult to distinguish withdrawal symptomatology from premenstrual symptomatology. Methodological variation, including limited sample size and possible selection bias, may explain some of the inconsistent findings across studies. Nonetheless, of the 9 studies that found significant phase effects, 7 noted heightened experiences of withdrawal and/or craving within the latter days of the menstrual cycle; i.e., the luteal phase. While further research is necessary to address methodological concerns and replicate these findings, this may suggest the need for focused cessation treatment during the luteal phase and/or quit attempts that are well timed relative to specific menstrual phases. This review was supported by National Institute of Drug Abuse (NIDA) Training Grant T32DA007288 (MJC), Component #3 (HPU) of NIDA P50DA016511 (KTB), and M01 RR0107 from the MUSC General Clinical Research Center. \*Correspondence: Matthew Carpenter, PhD: (843) 792-3974; carpente@musc.edu

## **ESTROGEN'S EFFECTS ON INFLAMMATORY-INDUCED PAIN ARE IN PART MEDIATED THROUGH ACTIVATION OF CYCLOOXYGESE (COX) BIOSYNTHESIS OF PROSTAGLANDIN E2**

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It is widely believed that pain affects men and women differentially; females demonstrate significantly higher behavioral responses to chronic and inflammatory pain than males. In female rats, we have recently shown that estrogen produces a persistent analgesic effect on injury (inflammation)-induced pain. Inflammatory-pain is caused by tissue injury that increases prostaglandin synthesis, elevates cyclooxygenase (COX) levels and pain hypersensitivity. COX, which has two isoforms COX 1 and COX 2, is the ratelimiting enzyme responsible for the synthesis of prostaglandins. In this study we aimed to determine if the activation of COX 1 and/or 2 are involved in estrogen effects in inflammatory induced pain responses. To this end, the effect of estrogen or the combination of estrogen plus NS398 [selective for COX 2; 20 mg/kg; i.p.], SC560 [selective for COX 1; 20 mg/kg; i.p.] or ibuprofen [nonselective COX 1 and 2; 40 or 100 mg/kg; i.p.] were tested using the formalin pain model. Using a computerized model, the number of paw flinches was measured during one hour of pre-treatment with the respective antagonist and one hour after formalin injections. Estrogen, Ibuprofen, or NS398 alone reduced the number of flinches during Phase II. Estrogen potentiated ibuprofen's behavioral effects during Phase II, estrogen plus 40 or 100 mg/kg of ibuprofen significantly decreased the number of flinches after formalin administration when compared to estrogen or ibuprofen treated groups. Although estrogen plus NS398 decreased flinching responses, their effect was not further potentiated. SC560 alone did not alter the level of flinching responses in female rats. The behavioral responses were correlated with a decreased in prostaglandin E2 release; suggesting that estrogen antihyperalgesic effects during injury induced nociceptive responses are in part mediated through inflammatory control mechanisms such as activation of COX 2. This work was supported in part by SCORE 506-GM60654 and SNRP NF 39534

## **METHADONE CONCENTRATIONS IN BREAST MILK AND BLOOD AND ASSOCIATED NEONATAL NEUROBEHAVIOR**

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Methadone maintenance offers major benefits to the population of opiate dependent pregnant and postpartum women, yet controversy exists regarding the practice of lactation in this group. This study evaluates 1) concentrations of methadone in breast milk and blood among a sample of mothers receiving methadone and 2) neurobehavior in their infants compared to a matched group of formula-fed infants. Nine methadone maintained (dose range 40–110 mg), lactating women yielded blood and breast milk specimens on days 1,2,3,4,14 and 30 after delivery at trough (just before single oral dose) and peak (3 hours after dose) maternal methadone concentrations. Three additional women yielded samples on days 1,2,3 and 4 after delivery. Paired specimens of foremilk (prefeed) and hindmilk (postfeed) were obtained at each sampling time. Infant blood was obtained on day 14. Urine toxicology screening thrice weekly for 30 days after delivery indicated that women were not using illicit substances. Breast milk specimens were analyzed utilizing LC-APCI-MS/MS for methadone and its primary metabolites EDDP and EDMP. Amounts of methadone in breastmilk were small (range 20.6–462.0 ng/mL). There was a significant increase in methadone concentration in breastmilk over time for all four sampling times: trough prefeed ( $t(41) = 2.56$ ,  $p = 0.014$ ), trough postfeed ( $t(37) = 3.28$ ,  $p = 0.0023$ ), peak prefeed ( $t(39) = 4.03$ ,  $p = 0.0003$ ), and peak postfeed ( $t(35) = 3.02$ ,  $p = 0.0047$ ). Eight subjects who delivered specimens at all collection points were matched for age, race, parity and methadone dose to eight formula feeding women. Infants in both groups had NICU Neonatal Neurobehavioral Scale assessments on day 3, 14 and 30. There were no significant effects of group or group by time interactions. Results contribute to the recommendation of breastfeeding for methadone maintained women.

## **MENSTRUAL SYMPTOMATOLOGY AND CIGARETTE SMOKING IN ADOLESCENT GIRLS: PRELIMINARY FINDINGS**

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Equivocal findings have emerged on the relationship between tobacco smoking and menstrual symptomatology. Our aim was to investigate a potential relationship of smoking behavior and menstrual symptomatology among adolescent girls. Data were collected from 12 smokers (mean years smoking 2.1 SD 1.4, mean Fagerström Test for Nicotine Dependence 6.5 SD 1.4, mean cigarettes per day 12.8 SD 4.2; mean age at menarche 12 SD 1) and 5 nonsmokers (less than 5 cigarettes lifetime) prior to participating in a randomized placebo-controlled treatment trial. Smokers and non-smokers were similar in age, Tanner staging, menarche and weight. Menstrual symptomatology questions were obtained using the menstruation module from the (Diagnostic Interview for Children and Adolescents) based upon DSM IV. Two-tailed Fisher's Exact analyses revealed a significant association between smoking and severe menstrual pain ( $p=0.05$ ); differences between groups in reported heavy periods, irregular periods, missing school because of bad cramps, severe menstruation pain, or seeking medical attention did not reach statistical significance. Further analyses from a larger group of girls are needed to fully explore the impact of smoking on menstrual symptomatology and quality of life. Supported by NIDA Intramural Funds

## **PROGRESSIVE RATIO RESPONDING FOR CIGARETTE PUFFS: EFFECTS OF DIETING STATUS AND CIGARETTE DEPRIVATION IN WOMEN SMOKERS**

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Compared with non-dieters, young women dieters are more likely to report smoking to help to control body weight. Furthermore, current dieters rate the act of smoking as less enjoyable than non-dieters, suggesting that their behaviour is primarily motivated by weight concerns rather than sensory/hedonic aspects of smoking (Jenks & Higgs 2003, *Appetite* 41, 223). The present study examined whether dieting and non-dieting female smokers also differ in appetitive motivation to smoke. Thirty female undergraduates at the University of Birmingham (15 dieters and 15 non-dieters) attended two test sessions (smoking deprived and non-deprived) in a counterbalanced order. The deprived session required six hours (minimum) smoking abstinence verified by expired air carbon monoxide measurement. At both sessions, participants executed keyboard bar-presses to obtain cigarette puffs according to a progressive ratio schedule of operant reinforcement (the response requirement doubled after each reinforcement). The measure taken was the final ratio completed before responding ceased (the "break point"), which is often taken as a measure of appetitive motivation. Sensory/hedonic ratings of smoking were also completed after each puff. Dieters did not differ from non-dieters in smoking levels and dependence, but did score higher on measures of weight control smoking motivation. Cigarette deprivation significantly increased break points in both groups. However, dieters achieved significantly lower breakpoints compared with non-dieters, regardless of deprivation. Dieters also gave lower sensory/hedonic ratings overall compared with non-dieters but these responses were not affected by deprivation state. These data suggest that dieters are less willing to expend effort in order to gain cigarette puffs when compared to non-dieters even though they respond similarly to changes in deprivation state. Thus, dieters show reduced appetitive motivation for smoking. In line with previous data they also rate the act of smoking as less enjoyable irrespective of deprivation state.

## **GENDER DIFFERENCES IN CLUB DRUG USE AMONG YOUNG ADULTS**

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Gender shapes the practice of drug use in complex ways. Cultural bases of masculinity and femininity can profoundly influence the manner in which individuals manage their daily lives and engage in risk behaviors, such as the use of club drugs. Using data from a NIDA-funded study of club drug use among young adults, the authors explore gender differences in club drug use among young adults who patronize New York City dance clubs. The authors utilize both quantitative and qualitative data from the Club Drugs & Health project, a mixed-methods study with dual components. The surveillance of club drug use among club attendees ( $n = 1,914$ ) occurred utilizing a time-space sampling methodology. Multivariate logistic regression analyses revealed that male gender was predictive of greater ketamine use, GHB use, and

methamphetamine use ( $p < .05$ ), as well as a trend towards active club drug use, among young adults who patronize dance clubs. Female gender, however, was predictive of greater cocaine use ( $p < .05$ ) within this population. Using qualitative data from a sample of 400 young adult club drug users, the authors conducted a thematic analysis of club drug use narratives. They explored the influence of masculinity and femininity in the respondents' experiences of club drug use. The use of club drugs plays a role in the construction of gender in club subcultures. Furthermore, the interface of the specific effects of each club drug, gender identity, and various social contexts coalesce in sexual narratives to frame not only the experience of sex but the associated risks as well.

## **GENDER DIFFERENCES IN THE EFFECT OF BIRTH COHORT ON RISK FOR ALCOHOL AND DRUG DEPENDENCE**

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Due to dramatic changes in drug and alcohol use patterns in the U.S. during the 1960s and 1970s, rates of alcohol and drug dependence in this country increased among individuals who came to the age of risk during or after this period. The impact of these changes on gender differences in the prevalence of alcohol and drug dependence is poorly understood, but has important implications for our understanding of these disorders. We hypothesized that birth cohort and gender would interact to show a differentially increased risk for substance dependence in women born after 1950. Data analysis was conducted using a large, nationally representative sample, using in-person interviews with 43,093 adults aged 18 and older living in households or group quarters in the U.S. Odds of alcohol and drug use and DSM-IV diagnosed dependence stratified by gender and birth cohort, defined as before or after 1950. Only individuals born after 1950 came of age during the period when use of alcohol was more socially acceptable and drugs were more widely available. Results indicated that in the full sample, men and subjects in the younger cohort (born after 1950) are significantly more likely to have substance dependence. However, the proportion of women with a substance use disorder is rising among the younger cohort. There was a significant interaction of birth cohort and gender in the prediction of alcohol use ( $\beta = -0.35$  [SE=0.07],  $p < 0.0001$ ), drug use ( $\beta = -0.31$  [SE=0.07],  $p = 0.0001$ ), lifetime alcohol dependence ( $\beta = -0.62$  [SE=0.09],  $p < 0.0001$ ), and lifetime drug dependence ( $\beta = -0.56$  [SE=0.25],  $p = 0.03$ ). Gender-specific odds ratios indicated increased odds of use and dependence for both genders in the younger cohorts, but ORs were greater among women than among men indicating a closing gender gap in the prevalence of alcohol and drug use and dependence. These results suggest that sex differences in the prevalence of drug and alcohol dependence are decreasing in younger age cohorts due to larger increases in prevalence among women than men; young women may be in need of targeted prevention and treatment plans.

## **WHAT ARE THE SPECIFIC COGNITIVE EFFECTS OF TRANSDERMAL NICOTINE AND SMOKING, AND DO THEY DEPEND ON SMOKER'S GENDER?**

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Cognitive performance is impaired by tobacco abstinence and reinstated by smoking or nicotine replacement therapy (e.g., transdermal nicotine; TN). The specific cognitive processes that underlie these effects, and whether they depend on smokers' gender, have not been determined. The purpose of this laboratory study was to use process-specific cognitive tasks to examine potential gender differences in response to TN and smoking in overnight abstinent smokers. Participants (70 men, 54 women) completed four, 6.5-hour sessions in which TN was administered double-blind (0, 7, 14, or 21 mg, randomized across sessions) and a cigarette was smoked four hours later. Women participated during menstrual cycle days 2-16 to control for premenstrual symptomatology. Attention (alerting, orienting, and executive function) and spatial and verbal working memory performance were measured regularly, as were subjective effects, heart rate, and plasma nicotine. Threefactor ANOVA (dose, pre/post cigarette, gender) revealed that TN or smoking improved performance on different cognitive tasks. For example, active TN improved spatial working memory (e.g., mean correct response for 0 mg = 57%, 7 mg = 60%, 14 mg = 61%, 21 mg = 62%). Improvements in alerting and verbal working memory accuracy were only found after participants smoked, regardless of TN condition. TN and smoking reduced tobacco/nicotine abstinence effects and increased heart rate and plasma nicotine. Smoking related changes in heart rate were smaller as TN dose increased (e.g., mean beats/minute of 13.9 for 0 mg, 6.3 for 7mg, 4.6 for 14mg, and 3.3 for 21 mg). No significant interactions involving the gender factor were observed on any cognitive or physiological outcome measure.

In abstinent smokers, the cognitive effects of TN and smoking may differ, and do not depend on smokers' gender. Addressing impairments in alerting and verbal working memory may be important when supplementing TN-assisted smoking cessation.

### **HIV RISK BEHAVIOR AND PSYCHIATRIC SYMPTOMS AMONG HEROIN ADDICTS IN RUSSIA**

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Relationships between HIV risk and other demographic features were examined in Russian heroin addicts. Methods: 332 addicts who completed detoxification and provided informed consent were enrolled in two separate naltrexone trials. All participants were assessed at baseline for HIV drug and sex risk, and psychiatric symptoms. Results: HIV drug risk was mainly related to employment status, HIV sex risk, use of hallucinogens, and severity of psychiatric symptoms. HIV sex risk was mainly related to HIV drug risk, use of stimulants, and severity of psychiatric symptoms. Females had a more significant factors relating to drug and sex risk than males (HIV drug risk: 10 vs. 3; HIV sex risk: 12 vs. 7). Stepwise linear regression analyses showed that increasing age, employment, having medical problems and being more ready for change were associated with reduced HIV risk. Conclusions: HIV drug and sex risk behaviors in Russian heroin addicts are closely related to each other, and also to use of stimulants and high levels of psychiatric symptoms particularly anger. Both males and females have multiple risk factors, but women have more than males. Increasing age, less employment, having more medical problems, and greater readiness for change were associated with reduced risk. These data suggest multiple interventions that could reduce the chances for HIV spread in Russia, and that women are at particularly high risk.

### **GENDER DIFFERENCES IN TEMPORAL DISCOUNTING MAY EXPLAIN PATTERNS OF DRUG ABUSE**

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The effort to find the neuronal mechanisms involved in temporal discounting may be guided by the identification of the evolutionary problem that discounting solves. Bjorklund and Kipp (1996) suggested that different survival goals for males and females may contribute to development of gender differences in cognitive mechanisms involved with inhibition. Different survival goals may also influence differences in temporal horizons between males and females; however, previously reported gender differences in discounting are limited and have not been clearly distinguished from mechanisms of inhibition. Hyperbolic discounting ( $k$ ) values, reanalyzed from several studies, were used to determine the influence of gender on the discounting of temporally distant rewards independent of other demographic variables (e.g., age, education, monthly income). Females tended to discount temporally distant rewards less than males across reward classes (i.e., money vs. cigarettes) and direction in time (i.e., past gains or future gains). These results suggest that females exhibit extended temporal horizons compared to males. One possibility is that extended temporal horizons among females may influence mate preferences (e.g., preferences for mates that establish a long-term reputation for securing resources) and in concordance with memory mechanisms (e.g., a bias for remembering displays of success that occur despite great risk; Zahavi & Zahavi, 1996) contribute to the evolution of constricted temporal horizons among males.

### **ESTRADIOL ALTERS COX-1 AND COX-2 ACTIVITIES IN THE LUMBOSACRAL REGION OF THE SPINAL CORD OF OVX FEMALE RATS**

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Female rats display increased behavioral responses to inflammatory pain stimuli than male rats. Sex differences in inflammatory pain have been attributed to gonadal hormones effects; previous studies from our group have demonstrated that estrogen reduces formalin nociceptive response during Phase II of the formalin behavioral responses, an inflammatory nociceptive model. The mechanisms underlying this effect remain unclear. The aim of this study was to determine if estradiol alters inflammatory-mediated intracellular mechanisms. To this end, OVX female rats received 10 to 40% estradiol or empty SILASTIC capsules. Rats were sacrificed one week later. In the spinal cord, protein levels of COX 1 and COX 2 were determined using western blot analysis. Furthermore, levels of prostaglandin E2 and corticosterone,

important mediators of inflammatory responses, were examined using enzyme immunoassays or radioimmunoassays kits, respectively. Preliminary results indicated that while no differences after estradiol replacement in COX-1 protein levels were observed, a 30% reduction of COX-2 protein levels were observed. Moreover, corticosterone levels were increased while PG-E2 levels were decreased. Thus, suggesting that estrogen's antihyperalgesic effects on inflammatory induced nociceptive responses are in part mediated by interactions of corticosterone-COX activation. This work was supported in part by SCORE 506-GM60654 and SNRP NF 39534.

## **WHAT ELEMENTS OF MI BOOST CHANGE? SMOKING CESSATION MI INTERVENTIONS IN WOMEN POST PARTUM**

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**Aims:** This study examines the association between patient's and therapist's verbal behavior during a MI based smoking intervention for women post partum. Additionally, the effect of positive and negative patient behavior i.e. change talk and resistance talk on behavior change is investigated. **Methods:** As part of a randomized controlled trial, n=297 women post partum, who were formerly smoking received a tailored MI based intervention. N=163 sessions of currently smoking (n=86) and non-smoking (n=77) women were audio taped. Behavior counts were obtained using the Motivational Interviewing Skill Code (MISC) and the Motivational Interviewing Treatment Integrity (MITI) Code that measure relevant MI dimensions, e.g. MI Spirit (collaboration, autonomy, evocation), change and resistance talk. **Results:** Change talk was positively related to open questions and MI Spirit. Therapist's MI-consistent utterances, i.e. giving support or compliments, strengthening patient's autonomy, were negatively correlated with resistance talk. Multivariate logistic regression found self-efficacy and resistance talk to be significant predictors for smoking status at 6 months follow-up in women who were not smoking at the time of intervention. In smokers, future smoking status was predicted by self-efficacy and the percentage of complex reflections made by the therapist. **Conclusions:** Several expected associations between patient's and therapist's behavior were found. In MI interventions, the positive aspects of quitting should be tackled preferably with open questions and complex reflections. Therapists should show increased MI adherence in order to reduce patient resistance and enhance change talk. This may boost resources such as self-efficacy and support behavior change.

## **PRENATAL SUBSTANCE EXPOSURES AND DSM-IV DISORDERS IN ADOLESCENTS**

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We examined the relation of prenatal exposures to DSM-IV disorders in adolescents using data from 467 mother-child pairs. Alcohol, marijuana, and tobacco use were assessed prenatally. At 16 years, DSM-IV disorders were assessed in the offspring using the Diagnostic Interview Schedule (C-DIS-IV). Three diagnostic groups were created: Mood/Anxiety (Depression, Anxiety, PTSD), Disruptive Behavior (Conduct, Oppositional Defiant, Attention Deficit/Hyperactivity), and Substance Use (SUD: Alcohol Abuse/Dependence, Marijuana Abuse/Dependence, Tobacco Dependence). Covariates included race, sex, income, family history of alcohol problems, home environment, maternal psychopathology (grouped as above), maternal age, education, social support, and life events. Covariates were identified with logistic regressions. Prenatal substances and trimesters were evaluated separately. 52% of the adolescents were African-American; their average age was 16.9 years (16-19). Mean family income was \$2170/month (\$0-9990). Rates of adolescent Mood/Anxiety, Disruptive Behavior, and SUDs were 16% (n=74), 18.4% (n=85), and 20.6% (n=96), respectively. Third trimester alcohol exposure ( $\geq 0.5$  drink/day; OR 2.8; 95% CI 1.2, 6.8) female sex, younger maternal age, and maternal Mood/Anxiety disorder predicted offspring Mood/Anxiety Disorders. First trimester alcohol exposure ( $\geq 1$  drinks/day; OR 1.9; 95% CI 1.1, 3.3) and current life events predicted Disruptive Behavior Disorders. First trimester alcohol ( $\geq 1$  drinks/day; OR 1.7; 95% CI 1.1, 3.0) and third trimester alcohol exposure ( $\geq 0.5$  drinks/day; OR 3.4; 95% CI 1.4, 8.0), first trimester tobacco ( $\geq 0.5$  packs/day; OR 2.1; 95% CI 1.3, 3.4) and third trimester tobacco exposure ( $\geq 0.5$  packs/day; OR 1.9; 95% CI 1.2, 3.1), and Caucasian race predicted Substance Use Disorders. Prenatal marijuana exposure was not related to psychiatric disorders at age 16. Prenatal exposure to alcohol or tobacco significantly increased the risk of psychopathology at age 16. These results suggest that preventing drinking and smoking during pregnancy could reduce adverse psychological outcomes in adolescence.



## **RATES OF HIV DISEASE AMONG SOUTH AFRICAN DRUG USERS: AN EVALUATION OF GENDER AND DRUG USE TYPE AS HIV RISK FACTORS**

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Studies of HIV risk factors among South African drug users are in great need given the extent the pandemic has affected countries of the Sub-Saharan region. The present study sought to examine gender and lifetime use of opiates, cocaine, marijuana, and mandrax as risk factors of HIV status at baseline. This study is based on data from the International Neurobehavioral HIV Study, an epidemiological examination of neuropsychological, social, and behavioral risk factors of HIV, and Hepatitis A, B, and C in the U.S, South Africa, and Russia. The present study is based on the South Africa sample comprised of 144 drug users between 18 and 50 years of age in the Pretoria region. The Pretoria baseline sample was 91% Black and 65.3% male with 33.3% of the baseline sample testing positive for HIV. Multinomial logistic regression indicated that females (OR = 3.06; 95% CI = 1.42; 6.61) and opiate users (OR = 2.32; 95% CI = 1.00; 5.38) were significantly more likely to test positive for HIV while controlling for age and lifetime use of cocaine, marijuana, and mandrax. Specifically, 52% of females in the sample tested positive for HIV compared to 23.4% of males. In addition, 40.7% of opiate users tested positive for HIV compared to 20.8% of non-users of opiates. Lifetime use of cocaine, marijuana, and mandrax was not associated with HIV status. The study sample was not large enough to examine possible interaction effects between gender and opiate use statuses. However, the vast majority of female subjects reported no lifetime injection drug use suggesting unprotected sexual intercourse as the predominant HIV risk factor among South African women. The present study findings are among the first in a line of investigation designed to identify HIV risk factors among South African populations and develop prevention interventions that target identified risks.

## **CRACK-USING AFRICAN-AMERICAN MOMS: IS PARENTING A BARRIER TO SEEKING TREATMENT?**

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African-American women who abuse crack cocaine face not only challenges to parenting but also accessing services. Many of these women report trauma histories, psychological distress, high-risk sex practices, and a lack of resources beyond day-to-day needs. This NIDA-funded study explores differences between African-American mothers (n=635) who use crack cocaine and are either living with or have been separated from their children. The women are compared on measures of treatment needs, perceived access to services, perceived barriers to care, and treatment seeking for substance abuse and other health care services. Of women who were mothers to dependent children, 257 (40%) had at least one child living with them (Caregivers), while 378 (60%) had none of their children living with them (Non-Caregivers). Caregiver mothers were more likely to have health insurance and public assistance benefits than non-Caregivers. Significant differences were reported in instrumental support: If they were in a crisis, Caretakers perceived more assistance would be provided by relatives and neighbors than did non-Caretakers. Non-Caregivers were significantly more likely to be homeless, to have ever been incarcerated, and to have initiated substance use and sexual activity earlier in life than Caregivers. Non-caregivers were twice as likely to initiate substance abuse treatment even though Caregivers were twice as likely to have some form of insurance. Overall, Non-caregivers were more likely than Caregivers to seek substance abuse treatment: alcohol detox 26% vs 13%; outpatient 33% vs. 30%; and residential 44% vs. 34%. However, both groups were equally likely to seek medical health care services, such as annual physical and gynecological exams. Findings such as these raise old questions about whether professional treatment is supportive of substance abusing women with children, whereas, relatives and community support still holds as an important support system.

## **ESTRADIOL ENHANCES THE DISCRIMINATIVE-STIMULUS AND SELF-REPORTED EFFECTS OF D-AMPHETAMINE IN HEALTHY PRE-MENOPAUSAL WOMEN**

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Variation in the effects of psychostimulants in women and men might underlie differences in the addiction process. There is accumulating evidence that estradiol might be responsible for the enhanced response to psychostimulants sometimes observed in females. In the present study, 9 healthy pre-menopausal women who were using oral hormone-based birth control learned to discriminate 15 mg/70 kg oral d-amphetamine. In addition, subject-rated drug effect questionnaires and a performance task were administered throughout each experimental session. Once a discrimination criterion was met (i.e., at least 80% correct responding at the final, 3-hr post-drug time point for 5 consecutive sessions), a range of doses of d-amphetamine (0, 3.25, 7.5 and 15 mg/70 kg) was tested alone and in combination with sublingual estradiol (0 and 0.25 mg). Test sessions were conducted during the placebo phase of oral birth-control cycles when endogenous levels of both estradiol and progesterone were at their lowest levels. Data were analyzed using three-factor, repeated-measures ANOVA. d-Amphetamine functioned as a discriminative stimulus and produced prototypical stimulant effects (e.g., increased ratings on abuse-related items from self-reported drug-effect questionnaires, elevated blood pressure). Estradiol enhanced the discriminative-stimulus effects of the 3.25 mg/70 kg dose of d-amphetamine and decreased the time of onset of the discriminative stimulus effects of the 7.5 and 15 mg/70 kg doses of d-amphetamine. Similar effects of estradiol were found for subject ratings of Like Drug Effect on a Visual Analog Scale. In addition, estradiol increased composite score on the Stimulant subscale of the Adjective-Rating Scale at all active d-amphetamine doses. Finally, estradiol enhanced the effects of the lowest active dose of d-amphetamine on systolic blood pressure. These findings support the notion that estradiol increases sensitivity to the psychostimulant effects of drugs such as d-amphetamine. Supported by NCRR COBRE grant P20 RR15592.

## **GENDER DIFFERENCES IN PATTERNS OF ADOLESCENT SMOKING: POTENTIAL EFFECTS OF SOCIAL ENVIRONMENT**

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Previous studies have reported that adolescent girls may be more inclined to smoke for social reasons than boys. The purpose of this analysis was to examine real-time socio-environmental data to test whether girls were in fact more likely than boys to smoke in social situations. Adolescent smokers were prompted to report social environment and smoking behavior via electronic questionnaires at 3 time-points (early morning, after school, and bedtime), and also complete two additional self-initiated reports daily. Data from 2218 reports completed to date by 22 participants (mean age 15.8 years SD 1.2, 1 American Indian, 4 African Americans, 16 Caucasians, 1 Other) were collected. The presence of family and friends, and smokers and non-smokers and whether participants had smoked since their last entry was assessed. Linear regression analysis revealed no difference in the presence of family ( $p=.946$ ), or smokers ( $p=.702$ ) when smoking was reported. Boys showed a weak trend toward smoking more in the presence of friends and non-smokers ( $p=.171$  and  $p=.127$ , respectively). Contrary to our hypothesis, data suggested that boys were more socially influenced than girls in their smoking behavior. Further analyses of social environment and gender differences in smoking behavior using larger samples and adjusting for potential confounds of level of dependence and cigarettes smoked per day are needed. Supported by NIDA Intramural Funds.

## **ENHANCED PKA-REGULATED SIGNALING IN FEMALE RATS MAY CONTRIBUTE TO SEX DIFFERENCES IN COCAINE SELF-ADMINISTRATION**

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Chronic cocaine treatment produces long-term changes in the dopamine D1-cAMP-PKA signaling pathway that are thought to underlie the development of cocaine abuse. Previous work has demonstrated sex differences in progression to cocaine abuse. We therefore examined the possibility that this pathway is differentially activated by cocaine in male and female rats. Rats were allowed to self-administer cocaine under a discrete trial procedure allowing 24-hr access to cocaine (1.5 mg/kg) or saline for 7 days. Rats were then tested under a progressive-ratio schedule following either 0 or 10 days abstinence. Western blotting was used to evaluate markers of PKA signaling including phosphorylation of dopamine and cAMP-regulated phosphoprotein of 32 kDa (DARPP-32) at Thr 34 and glutamate receptor 1 (GluR1) at Ser

845. Levels of DARPP-32, GluR1, and CDK5 in the nucleus accumbens and striatum were also examined. Phosphorylation of DARPP-32 at Thr 34 was increased in female rats compared to male rats in the striatum, particularly at baseline and after a 10-day abstinence period. Phosphorylation of GluR1 at Ser 845 in the nucleus accumbens was differentially regulated in female rats and male rats as a consequence of cocaine administration. DARPP-32 and CDK5 were increased in the striatum in both male rats and female rats after a 0-day abstinence period compared to baseline and to a 10-day abstinence period. These findings indicate sex differences in PKA-regulated signaling at baseline and as a consequence of cocaine exposure, and suggest that PKA-regulated signaling in the nucleus accumbens and striatum may contribute to sex differences in cocaine self-administration.

## **BLOOD SHARING AND GENDER-BASED VIOLENCE AMONG IDUS IN DAR ES SALAAM, TANZANIA**

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The Tanzanian AIDS Prevention Project investigates injection drug use and sexual behaviors related to HIV transmission, and safer needle use and safer sexual intentions in a sample of injection drug users (IDUs) in Dar es Salaam, Tanzania. We hypothesized that illicit injection drug use may be a significant contributor to the AIDS pandemic in sub-Saharan Africa, especially in urban areas. Procedures: As part of a mixed method study, semi-structured, face-to-face interviews (n=71) were conducted in Swahili with 30 female and 41 male IDUs between February 2003 and October 2005. These qualitative interviews elicited thick descriptions of Tanzanian IDUs' attitudes and beliefs about HIV and its relationships to other topics, most particularly intentions to safer needle and sexual practices. Verbatim transcribed interviews were analyzed in ATLAS.ti using the constant comparative method. Results: Violence against female IDUs has escalated, in a large part because of male IDUs' frustration with female IDUs' income earning abilities as sex workers. The price of heroin in Dar has doubled between 2003 and 2005 and is now adulterated. It reportedly takes twice the amount of heroin it previously did to achieve the same high. During mid 2005, giving a syringe full of the first blood withdrawn after an injection to someone unable to purchase heroin emerged as a practice to help the desperate stave off withdrawal. Gender based violence escalated during late 2005 as men began routinely accosting women in shooting galleries and stealing their blood, syringes, and money. Despite IDUs knowledge of HIV transmission, harsh economic conditions, increasing heroin prices and its reduced quality have led to the emergence of blood sharing and increased violence against women. HIV prevention and safer needle use interventions in urban Tanzania should be gender specific and include strategies that could reduce violence against women and curtail blood sharing.

## **A LONGITUDINAL INVESTIGATION OF INTIMATE PARTNER VIOLENCE AMONG MOTHERS WITH CO-OCCURRING MENTAL ILLNESS AND SUBSTANCE ABUSE DISORDERS**

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Objective: Severe mental illness (SMI), substance use, and intimate partner violence (IPV) have emerged as major intersecting public health problems that adversely and disproportionately impact the lives of women in the U.S. This longitudinal study investigated the demographic and clinical correlates of IPV in a sample of 379 mothers with severe mental illness. Methods: We conducted a secondary analysis of longitudinal data using multiple logistic regression. Participants were part of a longitudinal, community-based study of mothers with severe mental illness. The women were interviewed initially in 1995-1996 (T1) and then about 20 months later in 1997-1998 (T2). Results: Multiple logistic regression analyses shows a significant positive relationship between alcohol and drug misuse and IPV at T2, indicating that women with the co-occurring diagnosis of substance misuse (dual diagnosis) are more likely than others to report IPV. The number of lifetime psychiatric hospitalizations and the number of symptoms related to psychiatric disability exhibited at the time of interview are positively associated with IPV, and age is inversely associated with IPV. Conclusions: Mental health professionals servicing mothers with mental health problems need to be aware and prepared to assess the significant correlation among these intersecting public health problems in order to affect successful interventions. Particular attention must be given to the special treatment needs related to dual diagnosis and victimization and its impact on this vulnerable population.

## **INTERACTIONS OF GENDER AND MENSTRUAL CYCLE PHASE WITH PROGRESSIVE RATIO MEASURES OF COCAINE SELF-ADMINISTRATION IN CYNOMOLGUS MONKEYS**

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Clinical and preclinical data suggest that fluctuations in ovarian steroid hormones across the menstrual/estrous cycle influence the behavioral and abuse-related effects of cocaine in females (see Mello & Mendelson, 2002; Lynch et al., 2002). The effects of gender, menstrual cycle phase, and ovarian hormone fluctuations on cocaine-maintained responding (0.032 mg/kg/inj) under a progressive-ratio schedule were investigated in four female and two male cynomolgus monkeys. Females were studied across 32 menstrual cycles, and ovulatory cycles were defined by luteal phase elevations in progesterone. Data were analyzed for the early and mid-follicular phase and the mid- and late luteal phase of the menstrual cycle. Progressive-ratio break points for cocaine were significantly higher in females than in males ( $p < 0.0001$ ), and these gender differences were greatest during the early ( $p < 0.001$ ) and mid-follicular phases ( $p < 0.01$ ) of the menstrual cycle. Progressive-ratio break points did not vary consistently as a function of menstrual cycle phase during ovulatory cycles, and there were no systematic patterns of progressive ratio break points during anovulatory menstrual cycles. There were no significant differences in progressive ratio breakpoints between ovulatory and anovulatory cycles. Although changes in ovarian steroid hormones may influence cocaine intake under some conditions, consistent patterns of responding for 0.032 mg/kg/inj cocaine were not detected during ovulatory menstrual cycles in cynomolgus monkeys. Lower doses of cocaine (0.01 and 0.0032 mg/kg/inj) are currently being examined under the same conditions. This research was supported by grants R01-DA14670, K05-DA00101 and K05-DA00064 from NIDA, NIH.

## **CHILDHOOD ABUSE, SUBSTANCE USE DISORDER, AND PREGNANCY PROBLEMS IN YOUNG ADULT WOMEN**

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This study aimed at determining the moderating role of current substance use disorder (SUD) in the association between severity of childhood abuse (physical, emotional, and sexual) and pregnancy problems (abortions, miscarriages, complications during pregnancy and delivery/PREG/PROB) in young adult women (age 19-23) who participated in a prospective longitudinal study since they were adolescents (age 14-18). The sample was composed of young adult women who at age 14-18 met criteria for a DSM-III-R diagnosis of SUD ( $n=146$ ) and controls ( $n=26$ ). The average age was 21.9 years ( $sd=1.69$ ). Fifty eight percent were Caucasians, 35% were African Americans and 6% belonged to other ethnic background. The educational level was 12.68 ( $sd=1.57$ ) and the level of socioeconomic status according to Hollingshead criterion was 33.30 ( $sd=10.96$ ). The results of the correlational analyses showed that physical ( $r=.20$ ,  $p=.01$ ), emotional ( $r=.14$ ,  $p=.06$ ), and sexual ( $r=.18$ ,  $p=.02$ ) abuse were correlated with PREG-PROB at age 19-23. Also, current SUD was correlated with childhood physical ( $r=.32$ ,  $p=.000$ ), emotional ( $r=.27$ ,  $p=.000$ ), and sexual ( $r=.28$ ,  $p=.000$ ) abuse. The results of the moderation analysis revealed that childhood physical abuse ( $Beta=.47$ ,  $p<.01$ ) and the interaction between physical abuse and SUD ( $Beta=-.43$ ,  $p<.05$ ) were associated with PREG/PROB ( $R^2=.08$ ,  $F=2.5$ ,  $p=.02$ ). Also, history of childhood emotional abuse ( $Beta=.37$ ,  $p=.01$ ), SUD severity ( $Beta=.27$ ,  $p=.04$ ) and the interaction between emotional abuse and SUD were related PREG/PROB ( $R^2=.11$ ,  $F=3.42$ ,  $p=.003$ ). The results of the analysis testing the moderating role of SUD in the association between sexual abuse and PREG/PROB were not significant. The data underscore the long lasting impact of childhood physical and emotional abuse in interaction with current SUD on young adult women's reproductive system.

## **HEALTHY LIFESTYLES: A PSYCHO-EDUCATIONAL GROUP PROGRAM FOR WOMEN WITH SUBSTANCE USE DISORDERS**

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Research indicates that achieving and maintaining a healthy lifestyle, including substance free activities, can decrease the probability of a relapse back to substance use, yet women in substance abuse treatment do not have time or do not take the time to take care of themselves and prepare for a substance free lifestyle. The purpose of this project was to offer women a weekly psychoeducational group program to provide them with the tools necessary to live a substance free, healthy lifestyle. The program consists of twelve

modules designed to promote a substance free lifestyle and enhance physical and mental health. Healthy Lifestyles utilizes a holistic approach, emphasizing healthy eating, exercising and relaxing, maintaining sobriety, enhancing healthy leisure activities, and initiating pro-social contacts for the women and their children. Topics addressed in the program include: physical activity, food and nutrition, wellness (medical and dental care), the science of substance abuse, recreation and hobbies, sexuality, mental health, social support networks, healthy parenting, sustaining a healthy lifestyle and relapse prevention. Each module of the program is two hours in length and involves 30 minutes of yoga training. Women in outpatient treatment for substance use were recruited from two Iowa substance abuse treatment centers to participate in the Healthy Lifestyles program. This program has been successfully implemented several times in two Iowa substance abuse treatment centers. Qualitative data suggests that participants utilized the information to develop healthier substance free lifestyles. Participants indicate that the program fostered the development of stronger support systems which assists with recovery. However, the success was confounded by poverty issues, such as inability to have appropriate exercise clothes, and limited resources to obtain healthy food options. Future research will be conducted to examine the effectiveness of the program in terms of leading a substance free lifestyle six months after program completion.

### **RISKY BUSINESS: SEXUAL BEHAVIORS, DRUG USE AND VIOLENCE AMONG SEX-TRADING WOMEN IN ST. LOUIS**

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To gain insight into behaviors prevalent among sex traders, such as high risk sexual behaviors, drug use, victimization, and street violence, women in the City of St. Louis Medium Security Institution (MSI) were interviewed between May and September 2005, for a series of focus groups. Eligible women included those with an arrest history who appeared in the St. Louis City or Missouri State Drug Courts. The sample of 30 was 70% African-American, ranging in age from 19 to 48 (mean=35.9). In accordance with focus group methodology, content of the groups varied depending on participant interest and input; however, several salient themes emerged. Participants noted that oral sex was the most common sex trade activity, and that they were paid not only to provide but also to receive oral sex. Rates charged by sex act varied widely but were often as low as a few dollars. Regular customers typically received 'discounts', and activity was reported highest around the first of the month, when customers were likely to have cash. Consistent with the literature, condom usage was described as irregular. In terms of drug use, participants reported that crack cocaine was most commonly used, with binges often lasting for several days. Regarding victimization, women frequently reported sexual abuse in childhood, and some described abusive relationships as adults, including one woman with visible scars resulting from being stabbed 47 times. Participants also reported being beaten and raped by customers, which led to their carrying weapons, ranging from knives to razors under the tongue, and sometimes perpetrating violence, including murder, as protection against further violence. These findings, already utilized to inform our current interview and HIV prevention intervention, will be described in greater detail to confirm the vulnerability of this population of women. These results suggest that more effective interventions are needed to assist this incarcerated population in making lifestyle changes beginning during incarceration and continuing after release.

### **HAND-IN-HAND PROGRAM: A PSYCHO-EDUCATIONAL GROUP PROGRAM FOR WOMEN WITH SUBSTANCE USE AND CO-OCCURRING MENTAL HEALTH DISORDERS**

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Forty to sixty percent of women in substance abuse treatment also have co-occurring mental health disorders. Women's understanding of their mental health and substance use disorders is limited, which impacts their recovery, medical compliance, and ability to manage both disorders. The purpose of this psycho-educational group program is to increase knowledge about substance use and co-occurring mental health problems in order to bring about a substance free lifestyle, increase medical compliance, and enhance physical and mental health for women with substance use disorders. The Hand-in-Hand program was developed by Prairielands ATTC staff, and incorporates a combination of motivational interviewing and cognitive behavioral techniques to assist clients in achieving their goals. This program consists of fourteen modules which teach clients specific strategies to attain and maintain mental health, including exercise, nutrition, physical self-care and how to be their own advocate for health through healthier communication with their family members, physicians, and psychiatrists. Specific areas addressed in the

program include: Family Relationships, Mental Health Promotion, Substance Abuse Continuum, Anxiety Disorders, Post Traumatic Stress Disorder, Coping with Grief, Depression, Bipolar Disorder, Schizophrenia, and Eating Disorders. Eight women from a community based substance abuse treatment center in Iowa were recruited to this program. Pre and post-tests were developed to assess change in knowledge of substance use and mental health, and evaluate treatment compliance. Qualitative data suggest that clients believed the program will help them achieve and maintain a successful recovery, and assist them in attaining medical compliance. Future research will be conducted to examine the effectiveness of the program in terms of general knowledge of mental health disorders and substance use disorders, communication skills, self-care, medical compliance, and recovery.

## **FACTORS ASSOCIATED WITH HEALTH STATUS—10-YEAR FOLLOW-UP OF PRENATAL COCAINE/POLYDRUG USE**

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Drug use during pregnancy may indicate risk for poor health outcomes. The relationship of demographic, pre and postnatal maternal drug use and partner violence with perceived health was evaluated. 184 (87 cocaine (C+); 97 non cocaine (C-)) urban, low SES women were recruited at infant birth and assessed after 10 years. The Medical Outcomes Study Short Form (SF-36 V2) and Conflict Tactics Scales-Revised (CTS-R) were used to assess eight physical and mental health domains, two health summary scores (physical functioning, role limitation due to physical and emotional problems, bodily pain, general health perceptions, vitality, social functioning, mental health and mental and physical health summary) and partner violence. Multiple regression analyses were used to evaluate the association between perceived health, substance use, and partner violence. Clinically elevated SF-36 scores were compared by cocaine status using Chi-square analyses. Prenatal cocaine use was associated with more bodily pain ( $p < .02$ ), poorer general health ( $p < .0002$ ), social functioning ( $p < .02$ ), and mental health (summary score) ( $p < .02$ ). Prenatal alcohol use was associated with role limitation due to emotional problems ( $p < .002$ ) and current use of alcohol ( $p < .009$ ) was associated with poor mental health ( $p < .03$ ). Prenatal tobacco use was associated with lower vitality ( $p < .009$ ) and current tobacco use was associated with poorer mental health ( $p < .05$ ). Greater partner abuse was associated with lower general health ( $p < .03$ ), less vitality ( $p < .02$ ), more bodily pain ( $p < .05$ ) and poorer mental health ratings ( $p < .01$ ). The effects of prenatal cocaine use, current tobacco and alcohol use on lower mental health ratings were mediated by partner abuse. C+ women had a higher percentage of scores  $< 1$ SD below the mean in physical functioning, bodily pain, general health, social functioning, role restriction due to emotional problems, mental health and physical health summary ( $p < .05$ ). Cocaine use prenatally, ongoing drug use, and partner violence are associated with poorer health outcomes in high risk women.

## **CLINICAL CORRELATES OF ACCELERATED AGING: MULTIPLE STEM CELL LINEAGE DEPRESSION IN ADDICTION**

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Previous clinical studies at our centre are consistent with accelerated aging occurring in addicts in the brain, dental tissues and hair. We have previously shown that mental index (MI) was statistically associated with dental index (DI). It was therefore of interest to determine if there was a statistical association between MI and DI on the one hand, and hair greying index (GI) on the other. Results from our recent surveys were combined. Complete data sets were available on 86 drug addicts (DA) and 9 general medical (GM) patients. There was no sex difference in the two groups. Age range was restricted to 19-45 years and the mean age was similar in all groups. Specific indices and between group differences of drug exposure have been previously described. Significant correlations between age and DI and GI were noted in both DA and GM. DI was associated with MI in addicts ( $P = 0.0089$ ) and with temporal greying in GM ( $P = 0.028$ ). MI tended to be associated with temporal greying in DA ( $P = 0.106$ ) and with vertex greying ( $P = 0.107$ ) in all patients. Temporal greying was associated with vertex greying in both DA and GM ( $P < 0.000001$ ). Other associations were not significant. In DA the lifetime alcohol consumption and temporal GI were both significant on multivariate regression. These results in these limited numbers indicate that there is a relatively weak association between DI and MI and hair greying, but remain consistent with a deleterious effect on accelerated aging in all tissue beds. This data clearly calls for further investigation in larger case

matched samples, and also indicate a basic sciences investigation of the likely effects of addiction to accelerate aging. Based on other data pro-apoptotic, stem cell inhibitory and disordered mechanisms of DNA repair may be implicated.

### **MATERNAL SEPARATION CAUSES CHANGES IN COCAINE SELFADMINISTRATION IN DAMS AND TREATED PUPS AS ADULTS**

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Repeated maternal separation (MS) of pups from dams is often used as an early life stressor (PN2-15) that causes profound neurochemical, neuroendocrine and behavioral changes in the pups that persist into adulthood. To examine the effects of MS on cocaine self-administration, four separation conditions were used: 15 or 180 minute separation (MS15 and MS180), brief handling without separation (MS0) and a non-handled group (NH). Dams were allowed to self-administer cocaine (0.25 mg/kg/infusion) during daily 2 hour sessions for one week after weaning. There was an overall significant effect of maternal separation on the cocaine self-administration of the dams however; the length of separation appeared not to affect the dams' behavior. The dams whose pups were handled in their presence (MS0) averaged more infusions per session during the first week than the NH group. The acquisition of cocaine self-administration (0.0625-1.0 mg/kg/infusion) was evaluated in the treated pups as adults. While the MS180s acquired at the lowest dose, the MS15s did not respond for cocaine at rates greater than that seen with saline administration. The NH group received the greatest number of infusions and intake at the highest doses. Following self-administration, no differences were observed between groups in activity of two liver carboxylesterases involved in the inactivation of cocaine, ES10 and ES4; suggesting that any differences in pharmacokinetics are not responsible for the behavioral differences observed. This data suggests that in addition to the profound changes that occur in pups as result of maternal separation, the dams are also susceptible to alterations in behaviors. NIH grants RR00165, DA00418 and DA015040.

### **GENDER DIFFERENCES IN RATES OF POSITIVE URINE DRUG TESTS FOR OPIATE, COCAINE, AND MARIJUANA USE AMONG SOUTH AFRICAN DRUG USERS**

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The present study sought to examine gender differences in recent use of opiates, cocaine, and marijuana as assessed by a positive urine drug test using gas chromatography/mass spectrometry methods. This study is based on data from the International Neurobehavioral HIV Study, an epidemiological examination of neuropsychological, social, and behavioral risk factors of HIV, and Hepatitis A, B, and C in the U.S, South Africa, and Russia. The present study is based on the South Africa sample comprised of 144 drug users between 18 and 50 years of age in the Pretoria region. The Pretoria baseline sample was 91% Black and 65.3% male with 33.3% of the baseline sample testing positive for HIV. Multinomial logistic regression indicated that females (OR = 3.29; 95% CI = 1.59; 6.80) were significantly more likely than males to test positive for cocaine while controlling for age. Specifically, 60% of females in the sample tested positive for cocaine compared to 33.0% of males. Multinomial logistic regression indicated that males (OR = 4.79; 95% CI = 1.83; 12.57) were significantly more likely than females to test positive for marijuana while controlling for age. Specifically, 90.4% of males in the sample tested positive for marijuana compared to 70.0% of females. There was no gender difference in rates testing positive for opiate use with 64.0% of females and 59.6% of males testing positive. There is a lack of research elucidating risk factors associated with drug use in South Africa. Improving our understanding of drug use risk factors may be central to efforts to prevent HIV and other diseases, such as Hepatitis B and C, given substantiated relationships between drug use and disease status.

## **MARIJUANA USE AND TOBACCO SMOKING TRAJECTORY: ASSOCIATED ETHNIC AND GENDER DIFFERENCES AMONG ADOLESCENT SMOKERS**

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Previous research has suggested ethnic and gender differences in first substance used, including more frequent use of marijuana (MJ) prior to first use of tobacco among African Americans (AA) compared to European Americans (EA). Blunt (guttled cigar filled with MJ) smoking combines the intake of tobacco and MJ. Our objective here was to examine ethnic and gender differences in cigarette consumption as a function of sequence of MJ or tobacco smoking initiation among adolescent smokers applying for tobacco cessation treatment. Three hundred and forty-one adolescent smokers [means (SD), 16.1 (1.2) years, 60% girls, 47% African-American, cigarettes smoked per day 15.6 (9.8)] completed a telephone interview as part of pre-eligibility screening for a smoking cessation trial. Substance use trajectory data included age at first cigarette puff and its temporal relationship to first MJ use, first cigarette type (menthol vs non), daily smoking, and number of currently smoked cigarettes per day (CPD). Sixty-six percent of adolescents reported current MJ use, and 45% of MJ users reported they had initiated MJ use before tobacco cigarettes. Eighty percent of MJ users reported smoking blunts. Analyses using independent t test showed that EA teens smoked more cigarettes than AA teens (17.8 vs 13.3;  $p < 0.001$ ). EA boys reported smoking five more CPD, on average, than EA girls ( $p < 0.001$ ). Among MJ users, AA who used MJ before tobacco reported smoking fewer cigarettes (14.8 vs 11.2;  $p = 0.046$ ), while there was no significant differences in EA adolescents based on order of substance use initiation. AA were also more likely than EA to report that their first cigarette was a menthol (88% vs 68%;  $p < 0.001$ ). Further identification of ethnic and gender differences in relationships among smoked substance use trajectory might inform culturally- and developmentally-tailored interventions to reduce youth substance use.

## **CHALLENGES OF RECRUITING HIGH-RISK DRUG-USING WOMEN FOR A HIV VACCINE TRIAL**

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Recruitment of women at the highest risk of HIV acquisition is necessary for clinical trials research testing HIV vaccines among high-risk populations. We use a community-based recruitment approach in order to target women who engage in risky drug-using and sex behaviors that increase their risk of HIV. However, recruitment of high-risk women presents several challenges given that this population tends to be difficult to track, prone to incarcerations and distrustful of government-sponsored research. Our recruitment approach is a multi-stage process involving ethnography, the use of a mobile assessment unit (van), and referral of eligibles to the research office for comprehensive medical screening and HIV testing. Four hundred sixty-one women in the Philadelphia metro area have been prescreened since August 2005. The mean age of these women was 36; 74% were non-Hispanic African-American, 20% non-Hispanic white and 6% were Latino. In the three months prior to screening, 80% reported using crack cocaine, 47% reported injecting drugs, 65% reported exchanging sex for money or drugs, 26% reported having unprotected vaginal or anal intercourse with an IDU. Two hundred thirty-four women prescreened eligible to participate in the HIV vaccine trial but only 73 have been screened in the office and 29 have enrolled to date. Of those who have completed medical screening 20% were determined to be HIV positive. Community-based recruitment strategies have successfully identified and enrolled women at the highest risk of HIV. However, major barriers exist in facilitating the linkage of eligible women from the community to the research office. While we continue to examine the barriers to participation, it is likely that clinical trials for HIV vaccines will need to become more deeply embedded in the communities from which potential participants are initially recruited.

## **MENSTRUAL CYCLE PHASE MODULATES PHENCYCLIDINE (PCP) SELFADMINISTRATION IN MONKEYS**

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Clinical and preclinical data indicate there are sexually dimorphic patterns of drug abuse and these differences are attributable to gonadal hormones. In humans, the positive subject-rated effects of drugs such as cocaine and amphetamine are more pronounced during the follicular phase of the menstrual cycle,



which is characterized by elevated estrogen and low levels of progesterone. During the luteal phase, characterized by increased levels of progesterone and moderate estrogen levels, human subjects report diminished positive effects. The purpose of the present study was to determine the effect of menstrual cycle phase on oral PCP self-administration in female monkeys. Three adult female rhesus monkeys (*M. mulatta*) trained to self-administer PCP served as subjects. Menstrual cycle phase was confirmed by presence of epithelial cells characteristic of follicular and luteal phases collected by vaginal swabbing. Amounts of PCP self-administered were examined during the midfollicular phase (days 7-10 from menses onset) and mid-luteal phase (days 20 -23 from menses onset). Monkeys self-administered PCP concentrations of 0.125, 0.25, and 0.5 mg/ml and water under concurrent FR 16 schedules of reinforcement across several months/cycles. Levels of PCP self-administration were concentration- and menstrual phase-dependent. The concentration response curve was shifted upward during the luteal phase. Numbers of deliveries were significantly greater during the luteal phase than the follicular phase for the 0.25 and 0.5 mg/ml PCP concentrations. The 0.125 mg/ml PCP concentration maintained the greatest number of deliveries and increasing the concentration produced significant decreases in deliveries at 0.25 and 0.5 mg/ml. The results from the present study suggest that menstrual cycle phase modulates PCP self-administration in female rhesus monkeys. Elevated PCP self-administration during the luteal phase may reflect a compensatory increase to overcome progesterone's negative effects. Supported by NIDA grants R01 DA02486-26 and K05 DA15267-04 (MEC) and T32-DA07097 (JLN)

### **SERVICE NEEDS, UTILIZATION, AND OUTCOMES OF WOMEN IN WOMEN ONLY AND MIXED-GENDER DRUG ABUSE TREATMENT PROGRAMS**

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Substance abuse treatment programs specialized for women have been developed over the past two decades; however, there is little research examining the effectiveness of such programs. This prospective longitudinal study compared service needs, utilization, and outcomes for 189 women in women-only (WO) programs to those for 871 women in mixed-gender (MG) programs in California. Data were collected at intake and at 3 months and 9 months following admission into treatment. The Addiction Severity Index (ASI) was administered to assess client's problem severity at both intake and the 9-month follow-up interview, and the Treatment Service Review was used to measure service utilization at the 3-month interview. Arrest records were also obtained from the Department of Justice. Results show that compared to women in MG programs, women in WO programs at baseline were less educated and more likely to be white, physically abused in the past 30 days, and receiving residential treatment (as opposed to outpatient treatment). Women in WO programs had greater problem severity in a number of domains including alcohol, drug, family, medical, and mental health. At the 3-month follow-up, more women in WO programs received employment, medical, parenting, and HIV services than did women in MG programs. They also reported receiving a greater number of alcohol, drug, and psychiatric services than did women in MG programs. Hierarchical linear models were applied to examine the effects of program characteristics (e.g., WO vs. MG, treatment modality) and client characteristics (e.g., demographic variables, primary drug, and baseline problem severity) on multiple outcomes (seven domains of the ASI and number of arrests). Controlling for other program characteristics and baseline client characteristics, WO programs demonstrated more favorable outcomes in drug use ( $\beta = -1.22$ ) and arrests (OR = .63, 95%CI = .99) at the 9-month follow-up. The two groups did not differ in other ASI domains. Implications for service improvement will be discussed.

### **HCV RISK FACTORS AMONG STREET-RECRUITED SUBSTANCE-ABUSING WOMEN**

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Hepatitis C virus (HCV) infection is one of the most frequent chronic blood-borne infections in the US, causing significant morbidity and mortality. Among the risk factors associated with the HCV infection, drug injection remains a predominate route of transmission. Sexual transmission of HCV is possible but much less efficient as compared to hepatitis B virus or HIV. Other routes of transmission including tattoos, piercing, and drug preparation equipment have been proposed. A limited number of epidemiological studies have examined the risk factors associated with the HCV transmission in women, particularly in minorities. We examined the HCV associated risk factors in substance abusing females involved in NIAAA and NIDA funded HIV prevention studies of street recruited women. As a part of the 12 month

follow-up, participants were interviewed about drug equipment sharing practices, tattoos, body piercing, and blood transfusions and sharing of the personal hygiene equipment. Among 782 predominantly African American women, 152 tested positive for HCV antibody and had completed the 12 month follow-up. HCV positive women, compared to HCV negative women, had significantly higher lifetime rates of drug injection (60% vs. 6 %); HCV positive drug injectors were more likely than HCV negative drug injectors to report reusing needles and syringes as well as other drug preparation equipment used by someone else (60% vs. 38% and 49% vs. 30% respectively). Although cocaine use was highly prevalent in the entire sample (70.2%), HCV positive women were more likely to smoke crack cocaine (95% vs. 71%). Among cocaine users, HCV positive women were more likely to reuse related equipment (79% vs. 65%). HCV positive women were also more likely than HCV negative women to have a tattoo (36% vs 25%) or receive a blood transfusion (33% vs. 17%). No differences were observed related to body piercing or sharing of the personal hygiene equipment. To identify if other than parenteral routes of transmission play a role in HCV acquisition, multivariate logistic regression analysis will be applied to these data.

### **LEVERAGING TECHNOLOGY: EVALUATION OF A COMPUTER-BASED BRIEF INTERVENTION FOR POSTPARTUM DRUG USE AND A DYNAMIC PREDICTOR OF TREATMENT RESPONSE**

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The present study is an examination of the response of postpartum women with histories of drug use to a single-session computer-based motivational intervention. This study also evaluated the ability of changes in within intervention state motivation ratings to predict intervention outcome. A total of 107 postpartum women who reported drug use in the month prior to pregnancy were recruited prior to leaving the hospital, and randomly assigned to 20-minute computerized intervention vs. control conditions. The primary intervention consisted of three separate components presented in counterbalanced order; participants completed visual analogue scale ratings of intention to quit, problem recognition, and treatment readiness at baseline and after each of the three intervention components. Primary outcomes included changes in self-reported drug use and drug use as confirmed by urinalysis, both measured at 3-month follow-up. Intervention effects on changes in drug use were significant for drug use frequency averaged across all substances ( $p = .042$ , Mann Whitney U test; Cohen's  $d = .46$ ) and for illicit drugs other than marijuana ( $p = .032$ , Mann Whitney U test;  $d = .40$ ), but not for marijuana alone ( $p = .202$ , Mann Whitney U test;  $d = .39$ ). Intervention effects for dichotomous outcomes (yes/no for marijuana use, drug use other than marijuana, and any drug use) were not significant, but yielded similar effect sizes. Regarding dynamic prediction of intervention effects, intervention-associated decreases in self-reported drug use intention (vs. ratings made immediately prior to the intervention) were predictive of use of drugs other than marijuana ( $p = .045$ ) but not of marijuana use. These results suggest that brief computer-based interventions can be efficacious. These results also suggest that within intervention predictors of intervention response, used as proxy outcomes, may facilitate rapid intervention development and optimization.

### **RAPID ASSESSMENT OF DRUG USE AND SEXUAL HIV RISK PATTERNS IN VULNERABLE POPULATIONS IN DURBAN, PRETORIA AND CAPE TOWN, SOUTH AFRICA**

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The rapid assessment explored the linkage of drug abuse and HIV/AIDS among vulnerable drug using populations that could contribute to South Africa's heterosexually transmitted HIV epidemic. A cross-sectional, descriptive study was undertaken using observation, mapping, key informant interviews and focus groups in known "hotspots" for drug use and risky sexual behaviour in Cape Town, Durban and Pretoria. Focus group interviews included injecting and non-injecting drug users, commercial street sex workers (CSWs) and men who have sex with men (MSM) who also use drugs. Key informant interviews included the former together with service providers. Purposive snowball sampling and street intercepts were used to recruit adult drug users. Data were collected over a four-week period. Interviews and focus groups were facilitated and audio-recorded by a team of two trained fieldworkers. Key informant interviewees were offered free Voluntary Counseling and Testing (VCT) using the SmartCheck Rapid HIV-1 Antibody (finger-prick) Test in a non-clinic (private) field setting. Across sites 168 interviews were

undertaken, including 146 key informant and 22 focus group interviews. Over a quarter of participants agreeing to be tested were positive for HIV. Female CSWs, followed by MSM appear to be most at risk for drug-related risky sexual practices. Injecting drug users also reported engaging in numerous behaviors that put them at risk for contracting (and transmitting) HIV. Across the various groups there is a lack of awareness about where to access HIV treatment and preventive services, and barriers to accessing appropriate HIV and drug-intervention services were reported. Female CSWs were less well informed about HIV preventive services than other groups and were also less empowered to access services in general. Strategies for introducing or scaling up sustainable interventions to reach drug using populations especially vulnerable to HIV will be presented.

### **BRAZILIAN FEMALE CRACK USERS SHOW HIGH SERUM ALUMINUM LEVELS**

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Introduction: there is knowledge of the damage produced by crack smoking, but there is no information on its impact by using crushed aluminum cans as makeshift pipes, which is common in southern Brazil. Chronic aluminum intake is associated with neurological damage. We describe the impact of such form of use in serum aluminum levels (SALs) of crack smokers. Method: 76 current (30 days) female crack smokers were enrolled in the study by chain referral and snowballing. Their mean age was 28.4 (+/-7.8). They provided information on their drug use, and blood for SAL. Three SALs could not be used due to hemolysis. Results: respondents smoked on average 49 rocks per month (interquartile range from 16 to 90); 58 (79%) smoked from crushed can pipes, while 15(21%) reported other forms of crack smoking with indirect aluminum contact (aluminum foil on top of glass pipes). Of the 73 subjects, 53 (72.6%) had a SAL at the 2µg/l level and 13 (17.8%) had a SAL at the 6 µg/l cut-off point, which is above the maximum reference value. When these subjects were compared to a sample of non-drug users matched by mean age, we found similar median values and interquartile ranges for SAL between groups (3(2 -4.6) for crack smokers; 2.9 (1.6-4.1) for controls), but with different means and standard deviations (4.7 +/- 4.9 for crack smokers; 2.9 +/- 1.7 for controls (p=0.059, Mann-Whitney's test). Discussion: these crack smokers – either using or not crushed aluminum can pipes - have high proportions of SAL. Further studies are needed to elucidate and replicate these findings. If proven true in future research, preventive measures must be discussed for these high risk subjects.

### **ASSOCIATION BETWEEN DRUG ABUSE AND SPONTANEOUS OR THREATENED MISCARRIAGE IN PSYCHIATRICALY ILL WOMEN**

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From a large dataset of patients, we examined medication use and drug abuse across pregnancy in a low SES population of pregnant women who had a psychiatric illness. We examined significant associations between drug dependence and threatened or completed miscarriage. The data consisted of 121 pregnant women who were receiving prenatal care over a two year period. Information on age, diagnoses, prescriptions, type, dose and quantity of medications are included. Almost 20% of the women were diagnosed with drug dependency or abuse and 8% had toxic blood levels of psychotropic medication that required hospitalization. Sixty-two percent of the women had a primary diagnosis of Bipolar Disorder. The pregnant women had multiple health problems coded on Axis III: 58% had a pain diagnosis and 40% had infection and were prescribed various types of medications. A majority of the prescribed medications were antimicrobial, opiate analgesics or for treatment of psychiatric illness. Nine women had spontaneous abortions and 31 had a threatened spontaneous abortion. Spontaneous abortion was significantly associated with a diagnosis of Bipolar Disorder and multiple medication use during the first trimester. Both threatened abortion and completed miscarriage were associated with Polydrug Dependence (Chi-Square=9.329; p=0.01). We will present a multivariate model of predictors of miscarriage and threatened miscarriage. Conclusions: by diagnostic codes, none of the pregnant women were treated for their substance abuse or dependence. Bipolar pregnant women are at risk for miscarriage for multiple reasons. Reasonable treatments for drug dependence should be part of the risk to benefit assessment after women

with psychiatric illness become pregnant. Funding: grants DA00340 and DA015504 to AAP from the National Institute on Drug Abuse

### **TRAUMATIC EVENTS, PTSD, AND GENDER DIFFERENCES OVER TIME IN SYRINGE-EXCHANGE PARTICIPANTS**

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Few longitudinal studies have assessed ongoing exposure to traumatic events and posttraumatic stress disorder (PTSD) symptoms in out-of-treatment substance dependent people. The present study examines changes in traumatic event exposure and PTSD symptoms among male and female syringe exchange participants in Baltimore. Preliminary analyses include 162 participants; a larger sample will be available for presentation. Most (70%) participants are male, minority (75%), and unmarried (57%); average age is 41 years. A majority completed high school (58%), although only 18% are employed. Women were less likely than men to be employed (6% vs. 23%;  $p < .01$ ), but no other demographic differences emerged. Participants completed measures of lifetime traumatic event exposure and current PTSD symptoms at study intake and were followed for up to 16 months. Participants were asked monthly about traumatic event exposure in the preceding month; current symptoms of PTSD (Posttraumatic Stress Scale; Falsetti et al., 1993) were assessed at 4, 8, and 12 months. Data from the first 6 months are reported in these preliminary analyses. At each monthly follow-up, about half of the sample reported exposure to a traumatic event in the preceding month. Women were more likely than men to report traumatic event exposure at nearly every monthly follow-up. At Month 1, for example, 69% of women reported a traumatic event exposure compared to 41% of men ( $p < .01$ ). PTSD symptom severity was moderate at baseline (mean  $\pm$ SD:  $24 \pm 28$ ) and failed to change appreciably over time to the Month 4 followup ( $20 \pm 22$ ). Women reported greater symptom severity than men at both baseline ( $41 \pm 36$  vs.  $18 \pm 21$ ;  $p < .0001$ ) and Month 4 ( $28 \pm 23$  vs.  $17 \pm 21$ ;  $p < .05$ ). The high rate of new exposures to traumatic events and the largely unabated severity of PTSD symptoms in this sample, especially women, underscores the vulnerability of this population and the need to improve access to and motivation for treatment. Study supported by NIH-NIDA grants: K23DA15739 & R01DA12347.

### **REINSTATEMENT OF COCAINE-SEEKING BEHAVIOR IN RATS SELECTED FOR HIGH OR LOW IMPULSIVITY OR SACCHARIN INTAKE: SEX DIFFERENCES**

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Rats selected for high (HiI) impulsivity and those selectively bred for high (HiS) saccharin intake acquired cocaine self-administration faster than their low-responding (LoI, LoS) counterparts. This study extended these findings to the reinstatement phase and added a male/female comparison. Eight groups were compared: HiI Females (HiIF), LoIF, HiI Males (HiIM), LoIM, HiSF, LoSF, HiSM, and LoSM. HiI and LoI rats were selected based on performance on a delay discounting task for food that offered a choice of a small immediate or large delayed reward with a delay that increased after responses on the delay lever and decreased after responses on the immediate lever. A mean adjusted delay (MAD) was calculated for each session/rat, and this value was used to categorize rats. HiS and LoS groups were based on selective breeding. Rats were implanted with an i.v. catheter and trained to lever press under a fixed ratio (FR) 1 schedule for 0.4 mg/kg cocaine in 2 h sessions for a 10-day maintenance phase. Next, cocaine was replaced by saline for 14 days (extinction). Saline- and cocaine- (5, 10, and 15 mg/kg, i.p.) induced reinstatement of drug-seeking behavior was then measured over 6 days with saline and cocaine given on alternate days. HiIM and F and LoIM and F rats showed similar patterns of cocaine maintenance and extinction. In contrast, HiSM and F rats self-administered significantly more cocaine than LoSM and F rats during the maintenance phase, and they were slower to extinguish lever press responses when cocaine was replaced by saline. Both HiI and HiS male and female rats had significantly greater reinstatement of drug-seeking behavior following the 15 mg/kg cocaine priming injection than LoI and LoS rats. High levels of impulsivity and saccharin consumption predicted greater reinstatement of drug-seeking behavior. Females exceeded males in maintenance, extinction, and reinstatement. Male/Female, HiI/LoI, and HiS/LoS rats are useful models for studying vulnerability to drug abuse. Supported by R01 DA03240 and K05 DA15267 (MEC).

## **MALE-FEMALE DIFFERENCE IN RISK OF RAPID TRANSITION TO DEPENDENCE AMONG RECENT ONSET TOBACCO AND ALCOHOL USERS IN PERU**

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**BACKGROUND & AIMS:** In this work we seek to estimate possible male-female differences in risk of developing a dependence syndrome soon after onset of tobacco smoking and alcohol beverage consumption (i.e., within 24 months of starting use). For this purpose, we adapt epidemiologic survey methods now widely used in the USA. **METHODS:** The study data are from the Peruvian National Household Survey on Drug Abuse we conducted during 2002, with a representative sample of urban residents 12-64 years (n=4,850). **RESULTS:** A total of 472 respondents had just started to smoke tobacco; among these, an estimated 8% developed the tobacco dependence syndrome within 24 months of first use. The risk of rapid transition to dependence was 3 times greater for male smokers, as compared to female smokers ( $p<0.01$ ). Regarding alcohol, 654 respondents had just started to drink alcohol, of whom 3%-4% made a rapid transition to alcohol dependence (within 24 months of onset), again with three-fold excess risk for males ( $p<0.05$ ). **DISCUSSION:** These new findings from Peru are both convergent with recent evidence from the USA (e.g., for male excess in alcohol dependence, see Wagner & Anthony, under review) and non-convergent (e.g., for no male excess in tobacco dependence, see Storr et al., 2004). Aspects of traditional culture and gender-specific roles may continue to protect Peruvian women from rapid-onset tobacco dependence whereas this appears no longer to be the case in the USA. **SUPPORT:** DEVIDA –Belgian Technical Cooperation, Lima, Peru.

## **COCAINE ALTERS HIPPOCAMPAL AND STRIATAL PROGESTERONE AND ALLOPROGESTERONE LEVELS IN BOTH MALE AND FEMALE RATS**

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Acute and chronic cocaine administration increases plasma levels of progesterone in both male and female rats. This study aims to determine whether progesterone and its bioactive metabolite, allopregesterone (ALLOP), are altered in the hippocampus and striatum (areas known to modulate cocaine induced behavioral responses) after acute cocaine administration. To this end, intact male and female rats were administered 20 or 5 mg/kg of cocaine, respectively. Thirty minutes after drug treatment rats were decapitated, brain removed and analyzed for progesterone and ALLOP using HPLC. In both sexes, progesterone levels in the hippocampus and striatum were increased after cocaine administration. In saline treated controls, female rats have overall higher levels of ALLOP in the striatum and hippocampus than male rats. After cocaine administration, no significant alterations were observed in the ALLOP levels in the hippocampus or striatum. These results demonstrate for the first time similarly to previously reports in progesterone serum, cocaine also increases progesterone levels in the brain. Moreover, due to the bioactive role of ALLOP, because females have higher overall levels of ALLOP in the striatum, sexual dimorphic pattern in ALLOP concentration levels may have important consequences in the known sex differences to cocaine. This work was supported in part by SCORE 506-GM60654 and SNRP NF 39534.

## **HIGH-RISK DRINKING, SUBSTANCE USE, AND RISK BEHAVIOR AMONG COLLEGE STUDENTS: A PRELIMINARY INVESTIGATION**

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We compared high-risk drinking, substance use, and other risk behavior among a random sample of Greek affiliated (n=183) and non-Greek affiliated (n=642) college students. Hypothesis: We hypothesized that gender, age, number of sexual partners, experience of sexual coercion, and Greek membership would be associated with high-risk drinking, substance use, unprotected sex, and experience of violence. Procedures: The 44-item anonymous survey to assess health behaviors, which had a 40% return rate, was mailed to a random sample (N=825) of college students in 2002. Analyses: Descriptive and multivariate analyses were conducted to examine the variables of interest. Binge drinking was defined as 5 or more drinks in one sitting for males and 4 or more drinks for females. Results: Results from the descriptive analysis (which will be examined further using multivariate methods) indicate that among the total sample, there were no

differences in gender with respect to high-risk drinking or sexual experience (i.e., being sexually active). However, males were more likely to experience violence shortly after consuming alcohol or other drugs, whereas females were more likely to experience forced sexual touching. Binge drinking was associated with substance use in the past year and month. Binge drinking, Greek membership, greater perceived personal HIV risk and lower perception of others' HIV risk were associated with having multiple sexual partners. These findings were significant after controlling for race, age, and gender. Implications: Educational and prevention programs that are gender specific, target psychosocial factors associated with binge drinking, as well as consider the cultural and normative behaviors that are associated with Greek affiliation and that facilitate risk behavior are likely to be effective in changing short- and long-term behavior among college students.

## **SEXUAL ABUSE AND DRUG INVOLVEMENT AMONG MIDDLE SCHOOL STUDENTS IN MEXICO CITY**

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Exposure to violence is associated with drug involvement among adolescents. However, several questions remain to be answered, including: Is there a particular form of violence that has a greater effect on the risk of drug involvement and in the use of particular drugs? Do effects of violent victimization vary by gender? The present study is aimed at exploring one form of violence, sexual abuse, in relation with the use of tobacco, alcohol, marijuana, cocaine, inhalants, and psychotherapeutic drugs in a population of students of two middle schools located in downtown Mexico City. Methods. A total of 936 young participants (508 men, 428 women, mean age of 13.7 years), responded a self-administered questionnaire. Exposure to sexual abuse was assessed using an adapted question from a national student survey that specifically asked about lifetime sexual abuse. Drug use was assessed by asking if participants had used tobacco, alcohol, marijuana, cocaine, inhalant drugs, and psychotherapeutic drugs. Analyses were stratified by gender. GEE models will analyze profile responses of drug involvement. Results: An estimated 12% of the girls and 4% of the boys reported sexual abuse by a person at least five years older than them (chi square = 22.2,  $p < .001$ ). Males who were sexually abused had higher rates of alcohol use than those who had not been abused (83.3% vs. 59.5%,  $p < .05$ ), inhalants (31.6% vs. 5.4%,  $p < .001$ ) and cocaine (16.7% vs. 4.7%,  $p < .05$ ). Females who suffered sexual abuse had higher rates of use of tobacco (42.0% vs. 27.1%,  $p < .05$ ), alcohol (74.5% vs. 56.1%,  $p < .001$ ), tranquilizers (20.0% vs. 6.9%,  $p < .01$ ) and amphetamines (10.0% vs. 3.3%  $p < .05$ ). Comment: Limitations considered, these results can be useful to illuminate the discussion of the relationship between sexual abuse and drug involvement. Acknowledgement. CONACYT, Mexico, grant 25902H, NIDA, grant, DA12390, and NCMHHD, grant MD002217.

## **GENETIC INFLUENCES ON THE RELATIVE REINFORCING VALUE OF NICOTINE**

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This pharmacogenetic investigation examined the effects of naltrexone, a mu opioid receptor antagonist medication, and the functional mu opioid receptor (OPRM1) A118G polymorphism on the relative reinforcing value of nicotine. In a within-subject, double-blind study design, 30 smokers of each OPRM1 genotype (A/A vs A/G or G/G) participated in two experimental sessions following 4 days of naltrexone vs. placebo. On day 4, Participants were tested for the relative reinforcing value of nicotine using a cigarette choice paradigm that evaluates choice of 0.6mg vs. 0.05mg Quest cigarettes after a brief period (2hr) of nicotine abstinence. The main finding of this study was a significant gender by OPRM1 interaction; among females, the G allele was associated with a reduced relative reinforcing value of nicotine and among males there was no effect of OPRM1. The effect of medication phase was not significant. We subsequently genotyped our sample for a common functional Val108Met polymorphism that influences levels of COMT (catechol o-methyl transferase) enzyme, which degrades dopamine and metabolizes estrogen. We observed a significant COMT by gender interaction in the hypothesized direction; among females (n=21), the low activity Met/Met genotype was associated with a lower relative reinforcing value of nicotine. In a post-hoc analysis, women with the Met/Met genotype showed a further reduction in nicotine choices while on naltrexone as compared to placebo treatment. THIS RESEARCH WAS FUNDED BY A

### **MARIJUANA ARRESTS: INFLUENCES OF ETHNICITY, GENDER, BLUNTS VS. JOINTS, AND MARIJUANA ETIQUETTE**

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Problem: Thousands of persons, mainly young adults, are stopped and arrested annually for marijuana smoking and possession in New York City. Substantial racial disparities are evident. Background: The blunts (marijuana in a cigar shell) subculture is popular among African-American and Latino males young adults. Joint subculture participants are typically older whites, females, employed, and endorse marijuana etiquettes. Hypothesis: The ethnic disparities in police stops or arrests for marijuana violations are mediated in part by blunts smoking and endorsement of marijuana etiquette items. Methods: A peer group questionnaire was completed by groups of youths where one was a marijuana user. Marijuana users (N=514) were classified as: 1) blunts users (40%)-prefer and regularly smoked marijuana as blunts and seldom use joints/pipes. 2) joints users (25%)—prefer and regularly smoke marijuana as joints and rarely use blunts. 3) mixed users (35%)-report using marijuana as joints and blunts. Findings: African-Americans and Latinos and blunts users were most likely to be stopped/arrested. Females and those endorsing marijuana etiquette items had low police contacts. Logistic regression: Female marijuana users are less likely than males to be stopped (Odd Ratios ~ .38) or arrested (OR ~ .25). Likewise, blunts users are significantly more likely than joints users to be stopped (OR ~ 2.4, 3.3) and to be arrested (OR ~ 5.0, 5.3)-even after controlling for gender, ethnicity, and age. Latinos are more likely than whites to be stopped in the past year (OR ~ 4.0) and arrested (OR ~ 3.5, 6.0); blacks are somewhat more likely than whites to be arrested (OR ~ 2.4, 3.9). The mediating influence of etiquettes was small. Conclusions: A neglected lifestyle factor-being a blunts (or mixed) user-is more important than ethnicity in the risk of a marijuana-related arrest among these respondents. Ethnic disparities are not eliminated and only modestly reduced.

### **TOWARD A BETTER UNDERSTANDING OF THE RELATIONSHIP BETWEEN GENDER AND CRACK/COCAINE USE**

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Emerging literature suggests that inner-city substance-misusing women are more likely to use crack/cocaine than any other drug, yet little theoretical or empirical work addresses mediators of this relationship. To address this gap in the literature, the current study examined the role of theoretically relevant personality (i.e., negative emotionality, and impulsivity) and environmental (history of sexual abuse) variables as potential underlying mechanisms (i.e., mediators) of the relationship between gender and drug choice among 152 (37% female) patients receiving treatment for substance use in an inner-city residential treatment program. Results indicated that women were significantly more likely to use crack/cocaine than any other drug, and further were more likely to use crack/cocaine than men across current use and dependence status as well as lifetime use. Surprisingly, women evidenced higher levels of impulsivity than men. When considering lifetime drug choice, impulsivity mediated the relationship between gender and crack/cocaine use, yet mediation by impulsivity (or any other individual difference variable utilized) was not evident when considering current drug use and dependence. Negative emotionality and history of sexual abuse were related at a univariate level but not found to be mediators in any case. Together, these results suggest that impulsivity may underlie the choice of women to choose crack/cocaine when considered over their lifetime, and also suggest the need for the exploration of additional variables such as social context variables to account for current drug choice. Additionally, these findings raise important questions as to why women in this treatment setting would be more impulsive than men.

## **GENDER DIFFERENCES BETWEEN OUT-OF-TREATMENT INJECTORS**

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This study compared demographics, drug use, mental health status and HIV risk behaviors between male and female out-of-treatment injection drug users (IDUs) in Denver, Colorado. Between November 2000 and 2004, we recruited 802 participants through street outreach and conducted structured interviews examining a range of variables. The average age of participants was 39 years and 28% were female. Additionally, 50% were Caucasian, 21% African American, 20% Latino, and 9% of another ethnicity. Significant gender baseline differences were found. Female injectors were younger, had less education and were less likely to be employed, ever arrested or homeless as compared to male injectors. While male injectors had been injecting longer, female injectors reported injecting more amphetamines. Females had significantly higher rates of lifetime and current emotional, physical and sexual abuse as well as higher lifetime and current symptoms of depression, anxiety and suicidal ideation. Females had a higher perceived chance of getting HIV and reported engaging in risk behaviors that supported this perception. Almost half (40%) of female injectors reported using dirty syringes without bleaching, compared to 33% of males. In addition, 63% of females engaged in unprotected anal or vaginal sex in the last 30 days as compared to 43% of male injectors. Over half (59%) of the females had an IDU sex partner and 43% reported trading sex for drugs in their lifetime compared to 36% of males who had an IDU sex partner and 18% who traded sex for drugs. Results from this study show that female out-of-treatment IDUs engage in higher HIV risk behaviors than men. In addition, they appear to have many co-occurring issues that need to be better understood in order to develop effective outreach and intervention techniques. Supported by the National Institute on Drug Abuse DA09832.

## **GENDER DIFFERENCES IN SEXUAL RISK BEHAVIORS AND SEROPOSITIVITY AMONG YOUNG NON-INJECTION HEROIN USERS**

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**Introduction:** Despite the understanding shown in clinical trials that there are health and socio-psychological problems related to increased poly-substance use, researchers continue to study a single substance. The fact is that patients who exclusively abuse a single substance are unrepresentative of the population of substance abusers. This study aim to understand how gender plays a role in the prevalence of poly-substance use and its relation to HIV risk among each drug use combination. **Method:** The sample consists of 332 young males and 71 females. An office interview was used to collect the data. Participants received serum testing for the HIV antibody. **Results:** Nearly eighty-nine percent (88.6.0%) reported regular poly-substance use. Near equal rates of poly-substance use were observed by gender (males-89.5% vs. females-84.5%). Marijuana, cocaine and crack were the most prevalent drugs mixed. Females reported more co-use of crack (42.3% vs. 23.2%,  $p=.002$ ) and males reported more co-use of marijuana (55.1% vs. 39.4%,  $p=.018$ ). Non-significant differences were observed in the co-use of cocaine (males 27.7% vs. females 19.7%,  $p=.184$ ). Poly-substance female users were more likely to report sexual assaulted (38.3% vs. 3.4%,  $p<.001$ ), experience anxiety symptoms (38.3 vs. 17.5,  $p=.001$ ), engage in commercial sex (21.7% vs. 5.4%,  $p<.001$ ), have an IDU sex partner (10.0% vs. 1.7%,  $p=.004$ ) and STDs (26.7% vs. 3.4%,  $p<.001$ ). Poly-substance male users were more likely to report physically violent encounters (69.4% vs. 55.0%,  $p=.036$ ) and have a supportive peer (95.3% vs. 83.3%,  $p=.002$ ). Non-significant differences were observed regarding HIV status by gender, however females showed a higher percent of HIV+ than males (3.5% vs. 0.3%,  $p=.072$ ). **Conclusion:** High rates of poly-substance use were observed in male and female young adult non-injectors of heroin. Poly-substance use needs to be an area of research in future HIV/AIDS trials, particularly in addressing HIV prevention/intervention for female poly-substance users.

## **THE IMPORTANCE OF EARLY PROGRESS IN TREATMENT FOR FEMALE SUBSTANCE ABUSERS**

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The present study examines the causal modeling of treatment dynamics & change during treatment the context of a women's residential Therapeutic Community program with an enhanced trauma intervention. The research is guided by the TCU Treatment Process Model for understanding the full range of client & programmatic factors that affect in-treatment change & posttreatment outcomes. This study of female



substance abusers predicts that therapeutic relationship variables, along with program participation variables, have effects on retention in the program and, in the longer term, on posttreatment outcomes. The study hypothesizes that: (1) Individual change in early engagement (i.e., therapeutic alliance and satisfaction with program) will relate positively to treatment retention and progress in treatment; & (2) Retention & progress in treatment will relate positively to post-treatment outcomes. The study participants (n=260) are women, homeless or living doubled up & at risk for homelessness, who have substance abuse disorders & who are head of household with dependent child(ren). The core investigation uses a quasiexperimental, non-equivalent control group design (women enter either a TC with enhanced trauma services or a standard TC), with prospective, longitudinal repeated measures, intent-to-treat analyses and four assessment points: baseline (program entry), 3-months, 9-months and 15-months post-baseline. Treatment process measures were obtained at 1-month, 3-months and 6-months during treatment. Results: Causal modeling indicates the importance of (a) external circumstances impacting the client at program entry, (b) early therapeutic engagement, (c) personal progress in treatment, which are all related to (d) retention in treatment and successful exit, which, in turn, are related as predicted to reduction in trauma symptomatology at 15-month follow-up. The results of the present study will augment our understanding of treatment dynamics and progress for women in residential substance abuse treatment programs and has important implications for enhancing treatment engagement and retention for that population.

### **GENDER DIFFERENCES IN IMPROVEMENT IN READINESS TO CHANGE CRACK COCAINE USE: COMPARING PEER-ENHANCED VERSUS STANDARD HIV PREVENTION INTERVENTIONS**

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For over 25 years researchers have studied behavior change and addiction using the Transtheoretical Model. Research on the impact of intervention type as well as gender on readiness to change is scarce. EachOneTeachOne, a NIDA-funded HIV prevention study, aimed to reduce HIV risk behaviors among out-of-treatment drug abusers. It provided the opportunity to evaluate readiness to change cocaine use by intervention type (standard HIV education versus peer-enhanced) and gender using intent to treat analyses. Of the 929 crack cocaine users who completed a 3-month follow-up, 384 individuals (153 women, 231 men) were in the standard and 545 (241 women, 304 men) were in the peer-enhanced intervention. Four levels of crack cocaine use characterized users' days used in the past 30 days: none (0), low (1-5), moderate (6-14), and high (15-30). A continuous readiness score (Diclemente et al., 2004) was used to detect improvement in readiness to change cocaine use on three levels: precontemplation, contemplation, and preparation/action. As expected, there were no differences between intervention groups on readiness at baseline. Most participants were in contemplation (87% at baseline, 88% at follow-up). In terms of crack cocaine use, 54% were 'high' level users at baseline, with more women at this level (58%) than men (51%). Over time, frequency of crack cocaine use decreased from baseline (66% improved), with the peer-enhanced group showing greater improvement than the standard (70% vs. 61%). Among women in the standard intervention who improved in readiness score, 88% reported reduced frequency of crack cocaine use. The high numbers of individuals who remain in contemplation at baseline and follow-up suggests the need to refine the continuous readiness scoring algorithm or to better understand the impact of our intervention. Further analyses will examine both readiness score cutoff points as well as other explanations for findings.

### **THE COLORADO WOMEN'S PRISON PROJECT: PRELIMINARY FINDINGS AT BASELINE - SUBSTANCE ABUSE BEHAVIORS, HISTORIES, AND SERVICE NEEDS/UTILIZATION 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. Preliminary data is based on an initial cohort of 523 female offenders admitted to the Denver

Women's Correctional Facility (DWCF) between Feb. 2002 and October 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 behavior histories prior to the present incarceration of Young (less than age 40), n=377, 72%, and Mature (age 40+), n=146, 28%, female offenders recommended for intensive SA treatment during their present incarceration term. We further identify the 2 age cohorts' self-reported service needs 6 mo. prior to the present incarceration and subsequent service utilization while in prison. The total female offender cohort is predominantly Caucasian, under-educated, and unmarried; more than 1/3 had been unemployed in the year prior to their current arrest; the median age is 35. The women in the study have an extensive LT arrest history. Over 1/2 of them are parents, with an average of 3 children. While none of the services offered are age-specific, the 2 age cohorts utilized the services offered at DWCF at similar proportions. The profiles and behavior histories of the 2 age cohorts will be examined to identify and suggest more age-appropriate services for incarcerated female offenders.

### **PRENATAL OPIATE EXPOSURE FOLLOWED BY POSTNATAL WITHDRAWAL ENHANCES THE CORTICOSTERONE RESPONSE TO COCAINE IN ADULT RATS**

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Activation of the hypothalamic-pituitary-adrenal (HPA) axis is associated with increased risk of drug abuse initiation, escalation, and relapse. Developmental insults that alter HPA axis responsivity thus have the potential affect addiction vulnerability. We previously found that postnatal withdrawal from chronic prenatal opiate exposure is a developmental stressor, activating the HPA axis. Presently we examine the corticosterone response to acute injection with saline or cocaine in adults that received prenatal exposure to the long-acting opiate l- $\alpha$ -acetylmethadol (LAAM). Female Sprague-Dawley rats were administered 1.0 mg/kg/day LAAM or water via daily oral gavage for 28 days. Treatment continued throughout breeding and pregnancy. After birth pups from both groups were fostered to lactating, untreated dams. As adults the rats were implanted with jugular catheters (n=8-9 per group, half male and female). After recovery and adaptation to the blood draw procedure, the rats were injected with saline or cocaine (15 mg/kg, ip). One week later they received the alternate treatment, in a counterbalanced fashion. Blood was drawn at times 0, 15, 30, 45, 60, and 90 min post-injection. Sera corticosterone were measured by ELISA. ANOVA revealed no sex differences or interactions. Prenatal treatment did not affect basal corticosterone (80-93 ng/ml) or the response to saline. Both prenatal groups had elevated corticosterone to cocaine at 15, 30, and 45 min. However, the response to cocaine at 15 min was nearly two-fold greater in the prenatal LAAM compared to the prenatal water-treated group. This shifted time of peak response to cocaine to 15 min for prenatal LAAM vs. 30 min for prenatal water-treated rats. The magnitude of the corticosterone effect at 30 and 45 min was similar in both prenatal treatment groups. These data indicate that history of developmental exposure to opiates and opiate withdrawal affects the HPA axis response to acute cocaine challenge in adulthood. This may have implications for increasing abuse liability in affected populations.

### **GENDER DIFFERENCES IN THE PATTERN AND PREDICTORS OF THE CYCLE OF RELAPSE, TREATMENT RE-ENTRY AND RECOVERY**

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This study explores gender difference in the pattern and predictors of transition between relapse, treatment re-entry, and remission over a 4 year period. Data are from 1,202 adults recruited between 1996 and 1998 from sequential admissions to a central intake unit and 12 treatment facilities in Chicago. Participants were predominantly African American (89%), female (60%) and used cocaine, alcohol, opioids, and marijuana. Participants were interviewed annually 2 through 6-years post-intake (94+ % follow-up per wave). Participants were classified annually (1) in the community using, (2) incarcerated, (3) in treatment, or (4) abstinent. Most participants (79%) transitioned from one point in the cycle to another during the 4 years (31% two times, 19% three times, and 7% four times). The pattern of transitions and predictors of transition varied significantly by gender. The predictors varied by the type and direction of transition (e.g., using to abstinence vs. abstinence to using). Notably, among males more prior treatment (at the index intake) was related to remaining abstinent but among females it was related to relapsing. These findings indicate that the factor related to transitioning differ by gender and where the person is in the recovery cycle and suggest the importance of doing subgroup analysis. (Supported by NIDA DA15523.)

## **GENDER DIFFERENCES IN TREATMENT ENGAGEMENT AMONG A SAMPLE OF INCARCERATED SUBSTANCE ABUSERS**

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Gender differences have been noted in factors associated with substance abuse treatment entry, treatment retention, and treatment outcomes among substance abusers. However, limited research has focused on factors associated with treatment engagement among male and female substance abusers, and how those factors may differ across treatment programs. The purpose of this presentation is to examine gender differences in treatment engagement (TE), psychosocial functioning (PF), and criminal thinking (CT); 2) gender as a moderator of the relationship between TE and PF; and 3) gender as a moderator of the relationship between TE and CT. Participants were recruited as part of the NIDA funded Criminal Justice Drug Abuse Treatment Studies (CJ-DATS) Performance Indicators for Corrections protocol (Simpson, PI) from five collaborating research centers which included TCU, Univ. of KY, NDRI, Univ. of DE, and UCLA. Participants included 1,950 males from 15 programs and 824 females from 5 programs (N = 2,774 from 20 treatment programs). Participants completed a one-time survey which included TCU measures to focus on client indicators of treatment performance. Findings indicate that females reported more psychosocial dysfunction, less criminal thinking, and higher engagement than males. There was a stronger relationship between psychosocial variables and treatment engagement in female treatment programs when compared to male programs. Male programs had a significantly stronger relationship between cold heartedness (CT subscale) and low treatment engagement. Findings from this study suggest that it is important to examine factors that influence treatment engagement for male and female offenders. By assessing for factors that may influence treatment engagement early in treatment, programs may be able to target treatment interventions to address these problems in an effort enhance the retention rates, treatment experience, and treatment outcomes for substance using clients.

## **GENDER DIFFERENCES IN RISK FOR FORCED SEXUAL CONTACT AMONG CLUB DRUG USERS**

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Gender differences in reporting experiencing “date rape” were analyzed among an international sample of ecstasy users. Experiencing forced sex by a dating partner may be increased among females and males who report having sex while on Ketamine, Rohypnol, or GHB, drugs considered “date rape” drugs, or who report experiencing amnesia, a blackout, or being in a dangerous situation due to a date rape drug. In addition, we examined the possible effects of lack of parental monitoring at a vulnerable age. Club drug users from Miami, St. Louis, and Sydney, Australia were interviewed as part of the CD-SLAM study to evaluate the potential for ecstasy abuse and dependence using the Club Drug Risk Behavior Assessment and the Substance Abuse Module. Of the 624 respondents (mean age of 23.3, sd= 5.20), 268 (43%) were women, and of these, significantly more (25%) had experienced date rape compared to the men (10%) ( $\chi^2=26.90, p < .0001$ ). SAS logistic regression models by gender showed that date rape among men was significantly increased if they had had sex while on date rape drugs (OR 1.32, 95% CI 1.02, 1.71). Age, lack of parental monitoring and endorsing amnesia, black-outs or being in a dangerous situation due to a possible date rape drug were not significantly related to date rape. Among the women who had experienced date rape, risk climbed by age, with each year of life increasing the lifetime risk by 1.09 times, (95% CI 1.02, 1.16). Parental monitoring reduced their risk by .93 times (95% CI .88, .99). Date rape risk was not increased if the women endorsed having sex while taking date rape drugs or being endangered due to a date rape drug, yet further testing showed that women did not mix sex and date rape drugs less than the men. Although parental monitoring and not having sex while taking drugs affect the genders differently, both may help prevent forced sexual contact among populations of young adults, and may be important individual prevention strategies.

## **ESTRADIOL MODULATION OF NOCICEPTION, MORPHINE ANTINOCICEPTION, AND REPRODUCTIVE INDICES IN FEMALE RATS**

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The present study tested the hypothesis that the dose and timing of estradiol (E2) exposure needed to alter nociceptive sensitivity and morphine antinociceptive potency is the same as that needed to induce maximal reproductive behavior and uterine weight. In a previous study, ovariectomized female rats implanted with a 1-mm E2 capsule for 28 days showed maximal reproductive behavior and uterine weight (similar to gonadally intact females in proestrus/estrus), and when tested on the hotplate, had longer response latencies and were significantly less sensitive to morphine than ovariectomized females receiving no hormone treatment (Stoffel et al., 2003). In the present study, female Sprague Dawley rats underwent a simulated estrous cycle regimen of E2 administration for 20 days in which E2 (0.25 - 25 ug) or vehicle injections were administered for two consecutive days of every four days. Rats were then tested for nociception and morphine antinociception on the 50 degree C hotplate and tail withdrawal tests, or for reproductive behavior, at 4, 24, 48, or 96 hr following the last E2 injection. E2 increased reproductive behavior and uterine weight in a manner that was dependent on dose and time of exposure (effects maximal at 2.5-25 ug, 24 hr after the last exposure). E2 also increased latency to respond on the hotplate test in a dose-dependent manner, and similar to E2's effects on reproductive indices, this effect was greatest at 24 hr after the last E2 injection. E2 also had dose- and time-dependent effects on morphine antinociceptive potency; for example, on the tail withdrawal test, 2.5 ug E2 significantly increased morphine potency compared to oil-treated controls, but only at 24 hr after the last E2 injection. These results suggest that the effects of E2 manipulations that are reproductively relevant on basal nociception and morphine antinociception depend on the dose of E2 exposure and the timing of the test relative to E2 exposure. The results support the hypothesis that E2 modulates nociceptive and reproductive systems in concert.

## **PROGESTERONE BLOCKS ACQUISITION AND EXPRESSION OF COCAINE REWARD THROUGH BLOCKING SPATIAL MEMORY FORMATION**

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It has been recently demonstrated that sex differences in cocaine conditioned place preference (CPP) appear to be mediated in part by gonadal hormone dependent mechanisms. The present study aims to expand these results by determining the role of progesterone in the acquisition and/or expression of cocaine CPP in intact male and female rats and to further determine if the progesterone effects are mediated through learning and memory. For chronic progesterone treatment, rats received Silastic capsules with either progesterone (100%) or vehicle 1 week prior to conditioning. For acute progesterone treatment rats received s.c. injections of progesterone or vehicle before saline or cocaine (5 mg/kg in female and 20 mg/kg in males) on conditioning days (acquisition phase) or before testing (expression phase). Chronic progesterone replacement did not block cocaine-induced CPP. However, acute administration of progesterone during both the acquisition or expression phase of cocaine conditioning blocked cocaine-induced CPP in female but not male rats. Progesterone did not affect ambulatory or rearing behaviors. In an object recognition task, females showed better performance than male rats, and progesterone did not have any effect on either sex. However, in an object replacement task, a task mediated by spatial learning and memory, progesterone significantly impaired the retention in both male and female rats when compared to control groups. These results suggest that acute progesterone treatment interferes with cocaine-induced reward associations in intact female rats, possibly through spatial working memory consolidation, but not recognition memory. The observed sexual incongruities in progesterone effects on cocaine CPP may in part explain current sex disparities in overall cocaine use and rates of relapse. This work was supported in part by MIDARP, SCORE 506-GM60654 and SNRP NF 39534.

## **IMPACT OF BEHAVIORAL INCENTIVES ON RESIDENTIAL TREATMENT ATTENDANCE IN DRUG-DEPENDENT WOMEN**

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The purpose of this randomized clinical trial was to: 1) examine whether behavioral incentives improve attendance and retention in residential drug treatment; and 2) examine whether behavioral incentives affect

patient motivation and self-perceived ability to remain abstinent from alcohol/drugs. Participants were 94 drug dependent women. They had a mean age of 37.1 years (range 25-49) and approximately three-fourths (74.6%) were African American. All participants provided written informed consent to study participation. Women randomized to the incentive group received vouchers for attending a once weekly group according to an escalating voucher schedule. Control group participants received no incentives for group participation. Both groups, however, were compensated for completion of follow-up assessment measures. Incentive group participants attended significantly more groups (mean 5.6) than control group participants (mean 3.2) ( $p < .001$ ). Incentive group women also gave higher ratings than control group women to the statements “I am confident about my ability to stay drug free” (9.06 versus 8.45 ( $p < .05$ ); “I am working hard to stay alcohol/drug free” (9.67 versus 9.14;  $p < .04$ ); and “I feel confident and hopeful” (9.52 versus 8.80;  $p < .01$ ). Study findings suggest that modest incentives improve patient group attendance. They are also associated with more positive ratings of self-efficacy and motivation to stay drug free. This research was supported by NIDA DA 11476.

### **SELECTIVE IMPAIRMENTS OF EXECUTIVE FUNCTION IN YOUNG, FEMALE MDMA (“ECSTASY”) USERS: EFFECTS THAT ARE NOT ATTRIBUTABLE TO CONCOMITANT CANNABIS USE**

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Several studies have suggested that long-term users of methylenedioxymethamphetamine (MDMA or “ecstasy”) exhibit various kinds of neuropsychological impairment, particularly in relation to memory function and impulsivity. However, the extent to which concomitant cannabis use might contribute to such impairments remains contentious. The present study tested whether specific aspects of executive functioning are affected by chronic MDMA use in a sample of young women who were moderate users of MDMA ( $N=13$ ; mean frequency of use = 2.1 occasions/month,  $SD = 1.4$  occasions/month). Most studies to date have included males who are heavy users. To control for concomitant cannabis use, comparisons were made with a group of women matched for cannabis use but who had not used MDMA ( $N=14$ ), and also with a matched group of women who had not used either drug ( $N=14$ ). The average age of the sample was 19.5 yrs ( $SD = 1.6$  yrs); participants were matched for premorbid IQ. In accordance with current cognitive theory, we used a series of neuropsychological tests to measure specific submodalities of executive function, namely “shifting”, “updating”, and “inhibition”; we also tested memory function. MDMA users performed significantly worse than either control group on the “inhibition” task (Stroop colour-word reaction time). Impaired performance by the MDMA users on tests of “shifting” (alternating response patterns) and “updating” (monitoring and revising working memory representations) were task-dependent. The MDMA users also scored significantly lower than the other two groups on a test of verbal recall. The cannabis-only group did not differ from the non-drug user controls on any measure. The results are consistent with other studies that have tested similar functions in samples with male, heavier MDMA users. The impairments detected here cannot be attributed to concomitant cannabis use, nor to the use of other recreational drugs; they imply that even moderate use of MDMA can cause selective impairments of executive function in young women.

### **RISK FACTORS ASSOCIATED WITH ABUSE OF PRESCRIPTION OPIOIDS: RESULTS OF A NATIONAL SURVEY**

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Abuse (i.e., non-medical use) of prescription opioids is a growing problem in the U.S. Well-documented gender differences exist regarding illicit substance and alcohol use disorders, but little is known about gender differences associated with the non-medical use of prescription opioids (NMUPO). The purpose of this study is to investigate risk factors associated with NMUPO in women compared to men. We performed an analysis of the 2003 National Survey on Drug Use and Health, an annual survey of members of U.S. households aged 12 or older. Gender was our main independent variable of interest. We conducted a logistic regression model, stratified by gender, of past year NMUPO. We utilized study-calculated weights and SUDAAN software to adjust for the complex sampling design and non-response. Among 55,230 respondents, 52% were female, 70% were white, and 4.9% reported nonmedical use of prescription opioids in the prior year. Women were less likely than men to have past year NMUPO (4.5% vs. 5.2%,  $p=0.009$ ). Women were more likely to be on state-sponsored medical assistance programs (11.2% vs.

7.0%,  $p < 0.0001$ ), not in the labor force (34.5% vs. 20.4%,  $p < 0.0001$ ), and to have serious mental illness (11.2% vs. 6.6%). In addition, women were less likely to have used alcohol (60.0% vs. 69.2%), cocaine (1.6% vs. 3.2%), marijuana (8.0% vs. 13.2%), or heroin (0.07% vs. 0.2%) in the past year ( $p < 0.0001$  for all comparisons). Using multivariable logistic regression stratified among women (only), we found serious mental illness (OR 1.63, 95% CI 1.25-2.13); cigarette smoking (OR 1.26, 95% CI 1.01-1.60); and first use of illicit substances after age 24 (OR 1.80, 95% CI 1.01-3.23) were risk factors for NMUPO in the prior year, whereas no association was found among men for the same risk factors. Clinicians should recognize that women with serious mental illness, women tobacco smokers, and women who first use illicit substances as adults are at increased risk for NMUPO compared to men. These differences should enable clinicians to better identify, prevent, and treat NMUPO in women.

## **SPIRITUALITY AND ITS RELATIONSHIP TO SUBSTANCE USE AND COMORBID CONDITIONS IN AN ETHNICALLY DIVERSE ADOLESCENT TREATMENT POPULATION**

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Studies of spirituality/religion and substance use consistently show that adults and adolescents for whom spirituality is important are less likely to use alcohol and drugs. Differences by racial groups are also robust, with African Americans reporting higher levels of spirituality and lower rates of use. Similar results have been found in recovery samples of adolescents and adults. This study uses data from 3000 racially/ethnically diverse adolescents (46% White, 19% African-American, 12% Hispanic, 5% Native American, 1% Asian, 18% Multiracial) entering substance abuse treatment in a variety of programs, including outpatient, residential, school-based, and in juvenile justice settings. The goal of the study was to examine spiritual orientation by ethnicity and gender and its relationship to a wide range of substance abuse and psychological domains. Data from the Global Appraisal of Individual Needs' (GAIN) 7-item Spiritual Social Support Index (SSSI,  $\alpha = .84$  for this sample) and a variety of GAIN substance use and psychological scales were used for the analyses. Correlations between spiritual orientation, substance use severity, and comorbid conditions varied by race/ethnicity, sometimes dramatically. SSSI scores by racial/ethnic groups were significantly different ( $F=15.27$ ,  $p < .000$ ), with post hoc analyses showing Native American, Hispanic, African American, Asian, and Multiracial adolescents significantly higher in their spiritual orientation than Whites. In addition, African American and Asian girls were significantly higher in spiritual orientation than boys of their race/ethnicity. Results lend support to incorporating spirituality/religion into adolescent treatment programming, especially for programs targeting racial/ethnic minorities. Future analyses will focus on the relationship between spirituality, post-treatment outcomes, and long term recovery by race/ethnicity and gender. (Supported by CSAT contract 270-2003-00006)

## **REINFORCEMENT-BASED TREATMENT IS AN EFFECTIVE TREATMENT FOR DRUG DEPENDENCE DURING PREGNANCY**

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Introduction: Methadone stabilization is recommended for many opiate dependent pregnant women. However, a large number of pregnant women either do not qualify for or do not want pharmacological therapy. Interventions are needed to improve abstinence rates and retention in treatment for nonmethadone stabilized women. A clinical trial is being conducted at the Center for Addiction and Pregnancy (CAP) in Baltimore, MD, comparing a novel intervention, Reinforcement-based Treatment (RBT), to standard care practice in this population of women. Methods: Patients admitted to the program who did not want or did not qualify for methadone treatment were grouped as: 1) Standard Care (SC,  $n=24$ ), those receiving standard drug abuse treatment at the program or 2) Enhanced Care (EC,  $n=31$ ), those receiving RBT along with abstinent contingent housing for six months. The two groups were compared on demographic variables, days spent in treatment, and abstinence rates. The following results are based upon the data available to date. Results: The groups were similar on age, race, marital status, education and drug use history at treatment enrollment. Following consent to the study, approximately 50% of the SC group switched to methadone treatment (and therefore were disqualified from further study participation), versus only 16% of the EC group. The remaining participants (SC,  $n=12$ ; EC,  $n=26$ ) were compared on treatment outcome measures. Results indicate that the SC group spent significantly less time in treatment and had poorer abstinence rates compared to the EC group. The SC group was also significantly less likely to gain employment during treatment compared to the EC group. Conclusion: Preliminary results show that intensive treatment, along with contingent housing, contributes to improved outcomes for drug dependent

women not receiving methadone treatment. Additional data comparisons will be presented at the 2006 CPDD annual conference, including abstinence rates of at 1 and 3 month follow-up. Funded by RO1 DA 14979

### **SEXUAL AND PHYSICAL ABUSE IN CHILDHOOD AND VICTIMIZATION IN ADULTHOOD AMONG SUBSTANCE-USING WOMEN**

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We examined the association between childhood physical and sexual abuse, family dysfunction in childhood, early cocaine use and pathways to victimization in adulthood among (N=550) substance abusing women recruited for two community based HIV prevention studies. The women were predominantly African American (84%), with a mean age of 38 years (SD=7.2). The women were stratified into two groups, victimized in adulthood (VA) and non-victimized in adulthood (NVA). As children, VA's were more likely than NVA's to have been separated from their biological fathers (67% vs. 53%), forced to kiss or touch someone in a sexual way (39% vs. 14%), received unwanted kiss or touch (48% vs. 20%), forced to have sexual intercourse (33% vs. 15%), and beaten by a parent or a legal guardian severely (13% vs. 7%). Likewise, VA's were more likely than NVA's to report family disturbance in their childhood (70% vs. 58%). As adults, VA's were more likely than their NVA counterparts to have traded sex (69% vs. 48%), endorsed DSM-IV criteria for major depression (51% vs. 20%) and met DSM-IV criteria for cocaine dependence (81% vs. 61%). Preliminary path analysis confirmed a significant association between child sexual abuse and adult depression, cocaine dependence, sex trading and victimization in adulthood. Similarly, adult depression was found to be associated with both cocaine dependence and victimization in adulthood. The overall model showed reasonably good fit ( $\chi^2$  .9402, 17df, NFI=.9801, CFI=1.0, and RMSEA=0.000). This analysis suggested that childhood sexual abuse is a strong predictor of adult victimization among substance using women. (DA11622 and AA12111, LB Cottler, PI).

### **DECONSTRUCTING HIV PREVENTION INTERVENTIONS AMONG DRUG ABUSING FEMALE OFFENDERS: PRELIMINARY RESULTS OF LONG-TERM FOLLOW-UP EFFORTS**

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Drug abusers and ex-offenders are considered difficult to recruit into studies despite data showing the opposite (Cottler et al., 1996). Our goal is to re-interview a subset of women recruited from the St. Louis Female Drug Court (N=114) between 2001 and 2004 who participated in a randomized, peer delivered HIV prevention trial, to better understand how future interventions can be tailored to this high-risk population. Since October, we have attempted to contact 62 of the 114 women: 1) 25 completed the mixed method interview; 2) 1 was coded ineligible as she could not recall enough information about the prior study; 3) 2 refused to enroll; and 4) 34 outstanding cases will soon be released for field tracking. Cases were opened for follow-up, on average, 38 months after the original baseline interview; on average it took 9 contact attempts to relocate the 28 cases (range 1-31). Respondents reported that the persistent, respectful efforts of our team to contact them were the reason they returned after this period of time. Respondents also reflected on the positive impact of the intervention on their sex and drug use practices, and indicated that the most important component of the intervention was being tested for HIV and STDs, even though it was also the scariest. They believed the testing and counseling helped them change their high-risk behaviors. Some reported that the knowledge exchanged during the group sessions helped them reflect and change their lifestyle; others reported that being part of the study brought a sense of purpose and meaning to their lives, making them feel important and not like "just a street girl". Women reported challenges to participating in the intervention, including: transportation, being re-incarcerated while in the study, fear of testing and obtaining the results, the length of the interview, and discomfort with the personal questions. Implications of these findings for tracking, as well as intervention development, will be discussed.

## **SELECTIVELY WILLING: ATTRACTIONS AND BARRIERS TO HIV VACCINE RESEARCH PARTICIPATION AMONG CRACK-COCAINE-USING WOMEN IN PHILADELPHIA**

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Distrust is a challenge which confronts HIV prevention research conducted among populations experiencing high HIV incidence. Such individuals often experience social marginalization due to drug and/or sexual behaviors, poverty, racism, sexism, and homophobia, and are often leery of involvement with the medical establishment. In this study, semi-structured qualitative interviews were conducted among women crack cocaine users regarding HIV prevention research, including a Phase II trial of an HIV vaccine. The social contexts of drug use, HIV, and research were explored, including reasons for or against involvement in HIV vaccine research. Respondents expressed varying degrees of desire to participate, which was influenced by the type of research, procedures involved, perceived risks and benefits, and the significance of the study in their lives. Preliminary analysis suggests that major attractions included: the opportunity to get information and to potentially help others, as well as compensation for time and travel. Several respondents also mentioned positive impressions of research staff, and some perceive that they experience benefits from their interactions with them. Major barriers included: aversions to injections, distrust, and perceived potential consequences of participation such as: unknown potential side effects of the vaccine, the potential to test false positive on future HIV tests, and negative meanings ascribed to participant's roles (i.e. "guinea pig", "lab rat", "test dummy"). In addition, women discussed how logistical issues and personal commitments could also impede research participation. Findings highlight the importance of understanding community perceptions of vaccine research and using such knowledge to tailor education, recruitment, and other study procedures to respond to social and structural contexts in which research is carried out.

## **DISCRIMINATIVE-STIMULUS EFFECTS OF D-AMPHETAMINE IN WOMEN AND MEN**

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Men and women may respond differently to drugs of abuse. The results of some recent studies suggest that women are more sensitive to the effects of stimulants such as amphetamine and cocaine than men. In order to assess potential sex differences in sensitivity to the effects of d-amphetamine, we conducted a retrospective-analysis of six studies that employed identical d-amphetamine discrimination procedures and subject-rated drug-effect measures. Thirteen women and fourteen men were included in the analysis. In all studies, participants learned to discriminate 15 mg oral d-amphetamine. After acquiring the discrimination (i.e.,  $\geq 80\%$  correct responding on 4 consecutive sessions), the effects of a range of doses of d-amphetamine (0, 2.5, 5, 10 and 15 mg) were assessed. As expected, d-amphetamine functioned as a discriminative-stimulus and produced prototypical subject-ratings and cardiovascular effects. Men and women were not found to differ in their ability to discriminate d-amphetamine, nor did they differ in terms of the subject-rated effects of d-amphetamine. The results of this study suggest that men and women are not differentially sensitive to the effects of d-amphetamine. Future research should be conducted to determine if menstrual cycle phase might affect the discriminative-stimulus effects of d-amphetamine in women.

## **DAILY STRESSOR SENSITIVITY, ABUSE EFFECTS, AND COCAINE USE IN COCAINE DEPENDENCE: GENDER DIFFERENCES**

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This study highlights respondent sensitivity to daily hassles as it relates to situational cocaine use and perceived long-term effects of abuse exposure. Data were drawn from a larger study on stress reactivity in cocaine dependence. Participants (n=65) were cocaine dependent men and women without comorbid posttraumatic stress disorder (PTSD). They completed the Early Trauma Inventory, the Daily Hassles Scale (DHS), the Inventory of Drug-Taking Situations (IDTS), and the Time-Line Follow-Back (for prior 90 days). There were no gender differences on severity of cocaine use. Among men and women, greater reactivity to daily hassles was associated with greater likelihood of cocaine use in negative situations, but not positive or temptation situations. Gender differences emerged in the relationship of everyday stress



reactivity (DHS scores) to perceived long-term effects of general trauma and abuse exposure. Cocaine dependent men with higher daily hassle scores were more likely to report current relationship and emotional effects from general trauma exposure, childhood emotional abuse, and childhood physical abuse. Among cocaine dependent women, higher daily hassle scores were associated only with a greater likelihood of current emotional effects from childhood emotional abuse. Abuse exposure rates were significant, and appear to be associated with long-term sensitivity to daily stressors. These results are interesting in light of the PTSD exclusion criteria employed in the study. It is also interesting to note that cocaine dependent men and women appear to use more frequently in negative situations when they are reporting more distress from day-to-day stressors. This may provide information on targets for treatment through identification of triggers for use. The gender difference in associations between abuse exposure and sensitivity to daily hassles may also inform relapse prevention efforts. Data collection is ongoing and additional analyses are planned to examine reactivity to laboratory stressors as it relates to sensitivity to daily hassles.

### **RELATIONSHIP BETWEEN INTIMATE PARTNER VIOLENCE AND HEALTH STATUS AMONG DRUG-DEPENDENT WOMEN IN DRUG TREATMENT**

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Adverse health outcomes are consistently associated with intimate partner violence (IPV) however; findings regarding effects of IPV type and recency are less well established, particularly for women with drug dependence. The study question was: Is IPV type (physical, sexual or emotional) and recency (i.e., current: within past year or past) associated with poorer perceived health upon entry into drug treatment? A non-random sample of 100 women, primarily dependent on heroin or cocaine, was consented to one-time face-to-face interviews within 2 weeks of entry into outpatient drug treatment. Instruments included: Abuse Assessment Screen (AAS), Medical Outcomes Survey Short Form (SF36), Brief Symptom Inventory, and the Severity of Violence Against Women Scale. Preliminary findings for this report are limited to abuse as defined by the AAS and perceived health status as measured by the SF36. Women reporting the specific IPV category were compared to women who did not report that category. SF36 raw component scores (i.e., physical function, role-physical, role-emotional, energy/fatigue, emotional, social function, pain, & general health) and composite (physical & mental) scores were standardized. Higher scores are associated with better health. T-tests were conducted with SPSS 14 for Windows. The most frequent IPV category reported was current emotional (72.7%), current sexual the least frequent (28.4%), 25% reported being afraid of their partner, and 9.8% reported no history of interpersonal violence. Significant associations were found for current sexual IPV and emotional ( $p=.04$ ), social function ( $p=.05$ ), and general health ( $p=.04$ ). Fear of partner also had significant associations with physical function ( $p=.01$ ), role physical ( $p=.01$ ), social function ( $p=.02$ ), general health ( $p=.00$ ) and the physical composite score ( $p=.01$ ). IPV appears to be related to perceived health however, the association varies with IPV type and recency. When evaluating any type of IPV women should be specifically asked about fear in their intimate relationships.

### **GENDER DIFFERENCES IN THE EFFICACY OF INTERVENTION TRIALS ON PREVENTING TOBACCO SMOKING AMONG CHILDREN AND ADOLESCENTS**

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Introduction: Several childhood and early adolescent interventions have shown to be effective in preventing the onset of tobacco use. However, gender variation in the intervention efficacy is often ignored. In this study, we estimate the impact of two primary school interventions on preventing the initiation of tobacco smoking in youths stratified by gender. Methods: Upon entry into primary school in 1993, a total of 678 urban, primarily African American public school students were randomly assigned to a control group or one of two one-year interventions that sought to improve early primary school performance and behaviors: a classroom-centered intervention and a family-school partnership intervention. Youths were followed annually from grade 6 to 12 and completed ACASI interviews, which assessed the onset of tobacco smoking. Discrete-time survival analyses assessed time to first tobacco smoking as a function of intervention status after adjusting for parent's socioeconomic status, parenting characteristics, household tobacco use, teacher's rating of authority acceptance and shy behaviors,

children's own self-report depressed mood at first grade. Results: Boys in the intervention groups were less likely to initiate tobacco use compared to the boys in control group (estimated 56% in either intervention group as compared to 64% in the control group; adjusted Hazard Ratio=0.7, 95% CI: 0.5, 0.95). In contrast, there was no significant difference regarding onset of tobacco smoking between girls in the intervention groups (55%) and control group (53%). Comments: The findings suggest that the intervention trials targeting risk behaviors in early childhood is effective in preventing or delaying the onset of tobacco smoking among boys, but not girls. Strategies to prevent adolescent risk behaviors may need to be specifically designed for different genders. Acknowledgements: NIMH R01MH57005, NIDA R01DA11796 and NIDA 12390.

## **THE CONTEXT OF DRUG AND ALCOHOL USE AMONG SEX WORKERS IN PRETORIA, SOUTH AFRICA**

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High unemployment and low education in South Africa have forced many women to engage in sex work to support themselves and their family. Anecdotal reports suggest that sex workers use alcohol and drugs to reduce the discomfort and anxiety in having to conduct sex work. However, substance use has been known to impair behavior and may increase the risk for other negative consequences, such as victimization. Thus it is important to examine the context of substance use in this population. We use data from an NIAAA-sponsored randomized trial of a woman-focused, culturally sensitive HIV prevention intervention for Black and Coloured sex workers in Pretoria, South Africa to examine frequency of use and dependence on alcohol and drugs, and to examine whether substance use is associated with conducting sex work and victimization by clients and main sexual partners. Two hundred eighty five female sex workers who reported alcohol use on at least 13 of the past 90 days were recruited from street outreach between April 2004 and December 2005. Data from the baseline interview show that in the previous month, 92% reported getting drunk at least once, 48% used marijuana, and 13% used crack. Twenty-seven percent reported daily marijuana use and 5% daily crack use. Women reported drinking 4 or more drinks an average of 10 days in the past month, with an average of 11 drinks per day on days they drank. Sixty-five percent were characterized as alcohol dependent and 41% as drug dependent. Alcohol and marijuana use were both associated with sexual victimization by clients, alcohol use was associated with sexual victimization by main sexual partners, and marijuana use was associated with physical victimization by main sexual partners. Women were no more likely to drink alcohol or use drugs on days they had clients. Findings indicate that substance use among sex workers increases their risk of victimization by both clients and boyfriends. Reducing substance use may reduce negative health consequences in this population.

## **GENDER DIFFERENCES IN SMOKING EXPECTANCIES AND THE RELATIONSHIP OF EXPECTANCIES TO AMOUNT OF SMOKING**

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Beliefs about the effects of smoking are correlated with level of smoking and may play a role in relapse after smoking cessation. Participants (n=59) in the current study were 27 male and 32 female smokers recruited into a placebo-controlled clinical trial to examine selegiline hydrochloride as a pharmacological aid for smoking cessation. Smoking expectancies were assessed at baseline using the Smoking Consequences Questionnaire – Adult version (SCQ-A). No gender differences were found for demographic variables (e.g., age) nor for most smoking variables including level of smoking, plasma cotinine level, or level of nicotine dependence. Female smokers reported a longer duration of smoking (M=32.54, SD=10.34) than male smokers (M=25.67, SD=11.60;  $p<.05$ ). Male and female smokers differed significantly only on expectancies related to negative affect reduction with female smokers reporting stronger endorsement ( $p<.05$ ); however, this difference became nonsignificant after co-varying for duration of smoking ( $p=.14$ ). Expectancies related to stimulation, weight control, craving, and negative social impression were significantly associated with amount of smoking for both genders ( $ps<0.05$ ) while negative affect reduction and negative physical feelings beliefs were also associated with smoking for women. Linear regression analyses demonstrated that for men, negative social impressions and addiction beliefs accounted for a significant amount of variance (total  $R^2=0.88, p<.001$ ) while for women addiction and stimulation beliefs accounted for a significant amount of variance (total  $R^2=0.69, p<.001$ ) in current

smoking. Based on these results, information about the ways that expectancies relate to smoking for men and women may be used to develop, enhance, or tailor intervention efforts with the goal of increasing success at cessation and preventing relapse. Supported in part by NIDA grants R01-DA-15757 and K02-DA-16611(to TPG), and pilot funds from the Yale Transdisciplinary Tobacco Use Research Center (to AHW).

### **EFFECTS OF CHRONIC METHAMPHETAMINE USE IN THE PREGNANT RAT AND HER LITTER**

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These studies were designed to establish (+)-methamphetamine (METH) effects in pregnant rats and their fetuses as an aid to our understanding of human health effects. METH abuse by human mothers can lead to intrauterine growth restriction, premature delivery, and learning disabilities. To add to the problem, it is a popular drug among women of child-bearing age. For the studies, timed-pregnant Sprague-Dawley rats were implanted on gestational day 7 (GD 7 - prior to organogenesis) with sc osmotic minipumps that were prepared to deliver saline or METH (3.2, 5.6, 10, and 17.8 mg/kg/day). Ranges of mild to lethal (at 17.8 mg/kg/day) effects were found. METH-induced locomotor analysis was performed on the dams from GD 7 – GD 21. Maternal weight changes were also assessed. At GD 21, the dams and pups were sacrificed and the brains and sera were collected for determination of METH and (+)-amphetamine (AMP) concentrations. Complex dose-response relationships were observed for dam's weight during the study, as well as for METH and AMP concentrations in the brains and sera of both the dams and fetuses on GD 21. No differences were found in the litter weight on GD 21. In conclusion, the results of these studies provide the data needed for establishing an experimental pregnancy model in rats for studying monoclonal antibody medications for use in preventing adverse health problems in pregnant females and their fetuses. This research is supported by NIDA DA07610.

### **THE INFLUENCE OF CIGARETTE SMOKING IN OPIOID-MAINTAINED PREGNANT WOMEN**

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Prenatal tobacco exposure is associated with several medical and developmental consequences, including increased mortality and low birth weight. At present little is known about the consequences of tobacco smoking in opioid maintained pregnant women and the impact on neonatal outcome measures. This study examined prospectively the effects of cigarette smoking in 128 synthetical opioid maintained pregnant women and their neonates in a prospective way. Tobacco exposure was measured by the Fagerström Test for Nicotine Dependence pre and post partum. In addition we investigated the actual cigarette consumption based on maternal self-report. The mean age of the study participants was 25,66 years (range 16-37) with a mean duration of opioid dependence of 5 years. Fifty percent of the women received oral slow release morphine, 37,5% methadone and 12,5% buprenorphine. The first contact to the addiction clinic took place during second trimenon (mean=17,5 week of pregnancy, SD=9,54). At that time 98,4% of the women were smokers with a mean consumption of 21,22 cigarettes per day (two participants non-smokers). Based on our results a significant reduction of cigarette consumption was determined at post partum ( $p<0.001$ ), with a mean consumption of 13,74 cigarettes per day. In addition we found a lower degree of nicotine dependence to be associated with significant higher neonatal birth weight when compared to heavy nicotine dependence ( $p=0.045$ ). But our results did not show neonatal head circumference or APGAR-scores to be related to the amount of cigarettes. Moreover, we did not find significant effects of cigarette consumption and severity of nicotine dependence in regard to the severity of neonatal abstinence syndroms (NAS) or duration of neonatal treatment. These findings have to be carefully interpreted, as tobacco exposure is based on self-report data. More accurate measurements will be necessary in order to investigate the specific role of nicotine in opioid-exposed infants.

### **HEALTH STATUS AND SYMPTOMS AMONG YOUNG FEMALE ECSTASY AND OTHER DRUG USERS**

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A significant number of young, low-income women experiment with ecstasy outside of club or rave settings. No study has reported overall health status among this group of women. A cross-sectional survey

was conducted among 696 women aged 18 to 31 who sought gynecological care in southeast Texas between December 1, 2001, and May 30, 2003. Survey information included participants' demographics, obstetric & gynecological history, other physical health conditions and symptoms and mental health symptoms. Our study showed that 14% of participants (106/696) reported ever using ecstasy. Among Ecstasy users (n=106), 47% reported using it within the last 12 months, 64% reported ever using marijuana and 45% ever using any other major drugs including cocaine, heroin, LSD, PCP, etc. Our bivariate analyses showed that Ecstasy users were less likely to have obstetric and gynecological history than other illicit drug users, while were as likely as exclusive Marijuana users. Ecstasy users reported the highest number of chronic health conditions such as diabetes, heart disease, and depressive symptoms measured by SALSA. Further, Ecstasy users were as likely as other illicit drug users to report other physical symptoms such as aches, pains, nausea, vomiting, or heart pounding. After controlling for demographic characteristics, compared to none users, Ecstasy users were more likely to have more physical conditions and symptoms, and depressive symptoms. Compared to exclusive marijuana users, Ecstasy users were more likely to have more physical conditions and depressive symptoms. Compared to the users who used other illicit drugs except ecstasy, there is no significant difference. In conclusion, our findings demonstrated that ecstasy users, similar to other major illicit drug users, appear to have more physical and mental health problems than exclusive marijuana users and those who have never used any illicit drugs. Thus drug education and treatment need to target not only substance abuse problems but also deteriorated physical health conditions of young polydrug users including ecstasy users.

### **FLUTAMIDE REDUCES BENZOYLECGONINE LEVELS FOLLOWING COCAINE INFUSION IN MEN**

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A number of reports have shown that male cocaine users experience more adverse brain and vascular effects than their female counterparts. This could be due to testosterone, which may potentiate cocaine's vasoconstrictive effects. We examined whether the antiandrogen, flutamide (FL), alters cocaine's effects in men with histories of occasional cocaine use. Subjects (N=10) were studied twice in a within-subject, repeated-measures design. They were administered FL (250 mg) or placebo in a blind and randomized order on alternate days followed 2 hours later by intravenous cocaine (0.4 mg/kg). Vital signs, subjective ratings (Addiction Research Center Inventory), and blood samples were obtained at baseline and periodically for 1 hour after cocaine administration. Cocaine, benzoylecgonine (BE), and ecgonine methyl ester (EME) were measured by gas chromatography/mass spectrometry. There were no differences between FL and placebo on physiologic or subjective responses. Similarly, FL did not alter plasma cocaine or EME levels. By contrast, FL significantly reduced BE levels ( $F_{1,9} = 5.3, p < 0.05$ ), which were 19% lower 1 hour after cocaine infusion. These findings suggest that antiandrogen pretreatment either inhibits BE production or enhances its elimination following cocaine infusion. As BE promotes central and peripheral vasoconstriction, testosterone's effects on BE levels may contribute to increased vasoconstriction in male cocaine users and could lead to sex differences in cocaine's vascular effects that develop in chronic cocaine abusers. Supported by NIDA grants DA14674, DA09448, DA03994, DA17324, DA15032, and DA00343.

### **DELAY DISCOUNTING PREDICTS POSTPARTUM RELAPSE TO CIGARETTE SMOKING AMONG PREGNANT WOMEN**

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Women who quit smoking on their own shortly after learning that they are pregnant are referred to in the literature as "spontaneous quitters" (see Solomon & Quinn 2004 for a review). Spontaneous quitters exhibit greater success in initially quitting smoking than the general population of smokers, but higher than expected relapse rates postpartum. Although a variety of sociodemographic and pre-pregnancy smoking characteristics have been examined, much remains to be learned about the variables that affect relapse in spontaneous quitters. One such variable that may be important and is the focus of the present study is delay discounting (i.e., the rate at which people discount the value of delayed rewards). Indeed, an emerging area

of research demonstrates that drug abusers discount delayed rewards significantly more than non-drug abusers, suggesting that this characteristic may increase vulnerability to drug abuse (see Bickel & Marsch 2001 for a review). For example, smokers discount the value of delayed monetary rewards significantly more than nonsmokers. In the present study, delay discounting for money was assessed in 40 spontaneous quitters enrolled in a relapse prevention study. At baseline, discounting was negatively correlated with age ( $r=-0.40$ ,  $p=0.01$ ) and years of education ( $r=-0.31$ ,  $p=0.05$ ) and positively correlated with a history of depression ( $r=0.47$ ,  $p<0.01$ ). In univariate analyses, baseline delay discounting ( $t=-3.05$ ,  $p<0.01$ ) and having a history of depression (chi square=4.22,  $p=0.04$ ) predicted smoking status at 6 mos postpartum, but only delay discounting remained a significant predictor in multivariate analyses. The results provide initial evidence that an increased propensity to discount delayed rewards may contribute to postpartum relapse in spontaneous quitters.

## **GENDER DIFFERENCES IN ASSOCIATION OF THE HPER2 GENE POLYMORPHISMS WITH COCAINE DEPENDENCE**

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Previously, we demonstrated a differential regulation of the clock genes Per1 and Per2 expression after acute and chronic cocaine administration in the rat striatum. Other studies showed that the Per2 gene was involved in regulation of glutamate reuptake in the mouse brain and cocaine- and alcohol-induced behaviors. In humans, variations of the PER2 gene were found to be associated with regulation of alcohol consumption. In this study, we tested single nucleotide polymorphisms (SNPs) in the human PER1 and PER2 genes for association with cocaine dependence in an American Caucasian population. We genotyped 96 cocaine-dependent and 71 control subjects for nine SNPs in PER1 and five SNPs in PER2 genes. No statistically significant differences were found in genotype or allele frequencies of the SNPs studied in both genes between cocaine dependent subjects as a total group and control subjects. However, when the data were stratified according to gender, two alleles in PER2 gene, 1071G in intron 3 ( $p=0.025$ ) and 1965G in exon 17 ( $p=0.012$ ), were significantly overrepresented in female cocaine dependent subjects compared to female controls. The association of those SNPs were even stronger in the subgroup of cocaine dependent subjects with alcohol dependence ( $p=0.005$ , and  $p=0.003$ , respectively). These point-wise significant results are not significant experiment-wise after correction for multiple testing. However, these findings are still suggestive that the genetic variations of PER2 gene may contribute to a variety of neurochemical alterations which may be involved in drug addictive behaviors. (Supported by NIH-NIDA KO5-DA00049, DA05130, MH44292).



## College on Problems of Drug Dependence Women & Gender Junior Investigator 2007 Travel Awards

There is accumulating evidence that the antecedents, consequences, and mechanisms of drug abuse and dependence are not identical in males and females and that sex/gender may be an important variable in treatment and prevention outcomes. To foster research on women and sex/gender differences in all areas of drug abuse research, both human and animal, the National Institute on Drug Abuse encourages the submission of abstracts on this topic for the 2007 annual meeting of the College on Problems of Drug Dependence (CPDD).

Special NIDA travel awards of up to \$750 will be available to 30 junior investigators whose CPDD abstract on women or sex/gender differences is accepted for either a poster or oral session at the 2007 annual meeting in Quebec City, Quebec, June 16-21.

### Eligibility:

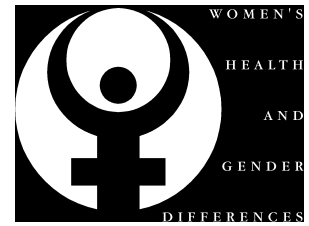
- Graduate and medical students, post-doctoral students, medical residents, and investigators who are no more than five years past the doctoral degree or residency are eligible.
- Applicant **MUST** be first author on the CPDD abstract.
- Minority investigators and male investigators are especially encouraged 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 2007 (ELECTRONIC SUBMISSION OF APPLICATIONS):

- Follow the CPDD instructions for abstract submission. Then send an e-mail to Aurora Hutchinson at [hutchinsona@nida.nih.gov](mailto:hutchinsona@nida.nih.gov) in the following format and with the required attachments:
  - E-mail Subject Line: 2007 CPDD Women & Gender Jr. Travel Awards Application
  - A copy of the abstract that you submitted to CPDD.
  - Your curriculum vitae (list all NIH grant support if applicable). Please ensure that your institution/work address, telephone number and e-mail address are included.
  - A cover letter indicating (1) your eligibility, (2) your career goals, and (3) your interest in continuing to pursue research on women and/or sex/gender differences.
- Applications for this award must be e-mailed by **January 15, 2007**.

For additional information about this annual award, contact Dr. Cora Lee Wetherington at telephone 301-435-1319 or at [wetherington@nih.gov](mailto:wetherington@nih.gov)





## Women and Sex/Gender Differences Program Announcements

**PA-03-139: WOMEN, GENDER DIFFERENCES AND DRUG ABUSE**

<http://grants1.nih.gov/grants/guide/pa-files/PA-03-139.html>

[NOTE: Watch the NIH GUIDE for a reissuance of this PA.]

**PA-05-083: DRUG ABUSE DISSERTATION RESEARCH: EPIDEMIOLOGY,  
PREVENTION, TREATMENT, SERVICES, AND WOMEN AND SEX/GENDER DIFFERENCES**

<http://grants1.nih.gov/grants/guide/pa-files/PA-02-055.html>

**PA-04-153: HEALTH DISPARITIES AMONG MINORITY AND UNDERSERVED WOMEN.**

<http://grants.nih.gov/grants/guide/pa-files/PA-04-153.html>

**PA-04-126. SUPPLEMENTS TO PROMOTE REENTRY INTO BIOMEDICAL AND  
BEHAVIORAL RESEARCH CAREERS**

<http://grants.nih.gov/grants/guide/pa-files/PA-04-126.html>

(Note: Subject matter of these supplements does not have to pertain to women and/or sex/gender differences. Applicants are typical women, but both men and women are eligible.)

For additional information:

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



# NOTES



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