Methamphetamines, mamas and munchkins – the drug epidemic we aren't talking about



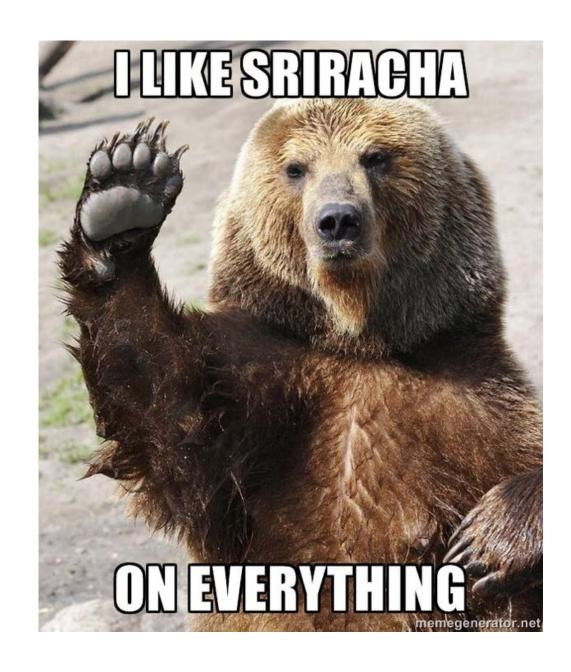


Marcela Smid, MD
Maternal Fetal Medicine
Addiction Medicine

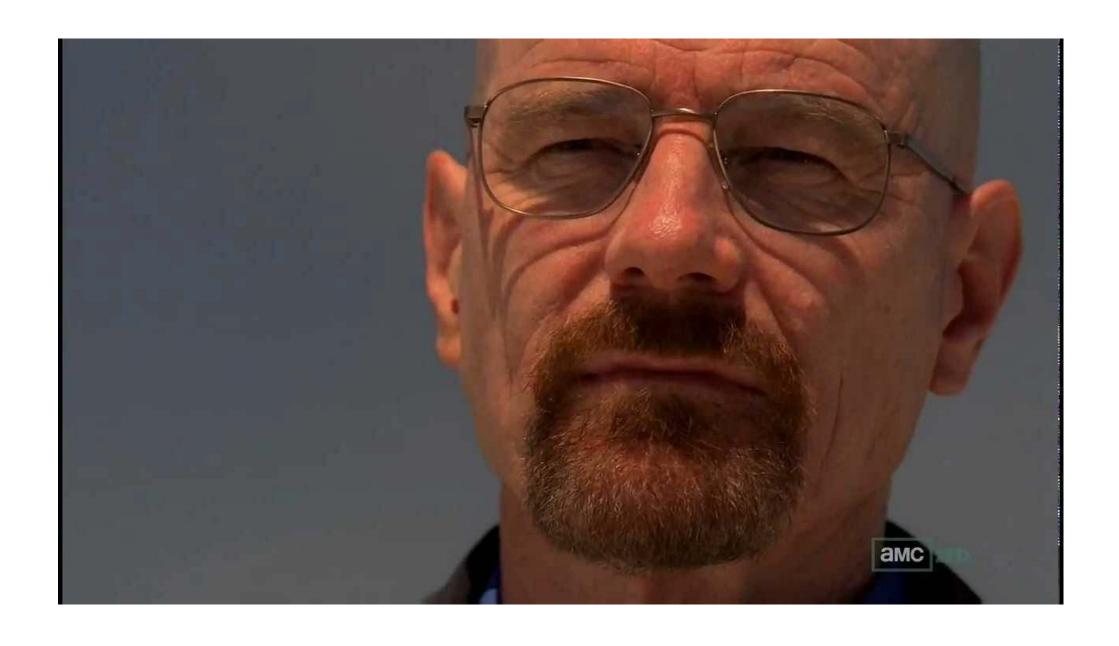


DISCLOSURE

Medical advisory committee for Gilead (I believe in universal Hepatitis C screening for all pregnant and reproductive age women)



WHO AM I?



MEDICAL DIRECTOR OF SUPERAD CLINIC – (SUBSTANCE USE & PREGNANCY: RECOVERY, ADDICTION AND DEPENDENCE)

- Specialty prenatal care for women with substance use disorders
- Co-located services:
 - MFM including ultrasound
 - Addiction fellows
 - Pharmacotherapy buprenorphine/suboxone
 - Addiction peer support
 - Case management from health plan
 - Resource management
 - Social work
 - On-site child care
 - Peer support
 - NOT a methadone clinic
 - Motto: "beg borrow and steal for services"





LEARNING OBJECTIVES

- The problem: Understand the "new epidemic" of methamphetamine use among pregnant women
- Sex, gender and drugs: Describe why methamphetamine is a compelling drug for women
- Mamas and munchkins: Discuss perinatal impact of methamphetamine use including maternal, fetal and infant outcomes
- What do we do: evidence-based interventions for pregnant/postpartum women using methamphetamines and the gaps in care

MOST IMPORTANT OBJECTIVE HUMANIZE THE ISSUE – MEET DONELLE GOINGS



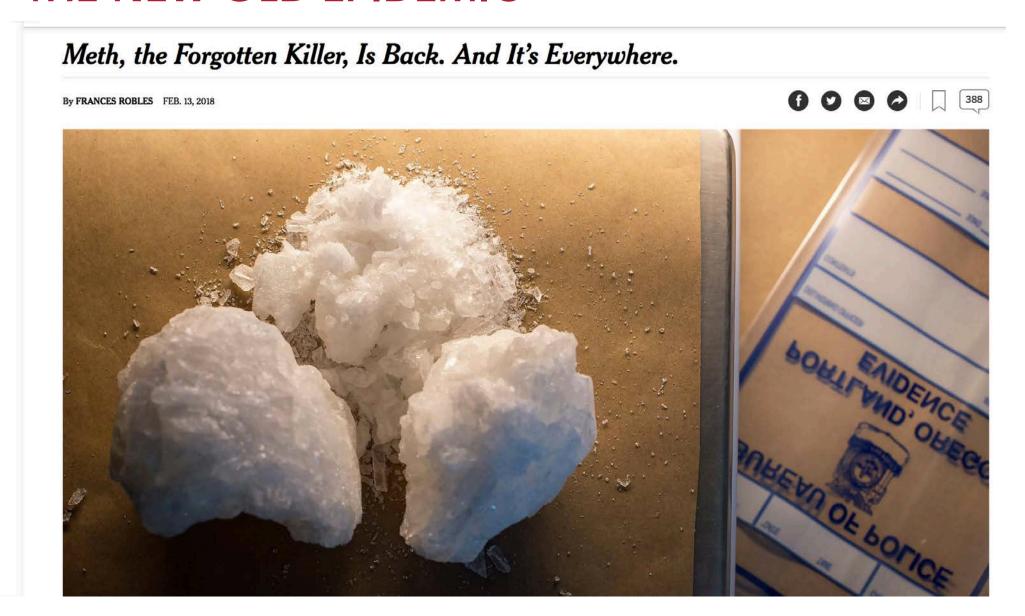
DONELLE IS ONE OF MANY

- In 2015, approximately 1.7 million
 Americans used
 methamphetamine in the past year
 - Past month use 897,000
 - Population of North and South Dakota
 1.64 million
- South Dakota:
 - Meth-related crimes increased 625% increased past 15 years
 - 2002 467 → 3390 in 2017 15 years
 - 64% of women and 27% of men in prison for drug-related crimes





THE NEW OLD EPIDEMIC



"Nearly 100 percent pure and about \$5 a hit, the new meth is all the more difficult for users to resist."

WHAT IS METHAMPHETAMINE?

- Methamphetamine highly purified derivative of amphetamine.
- Meth, ice, crank, speed, glass, crystal, tina, glass, poor man's cocaine, biker's coffee
- More potent than amphetamine
- Smoked, snorted, injected or ingested orally or anally







METHAMPHETAMINE LABS



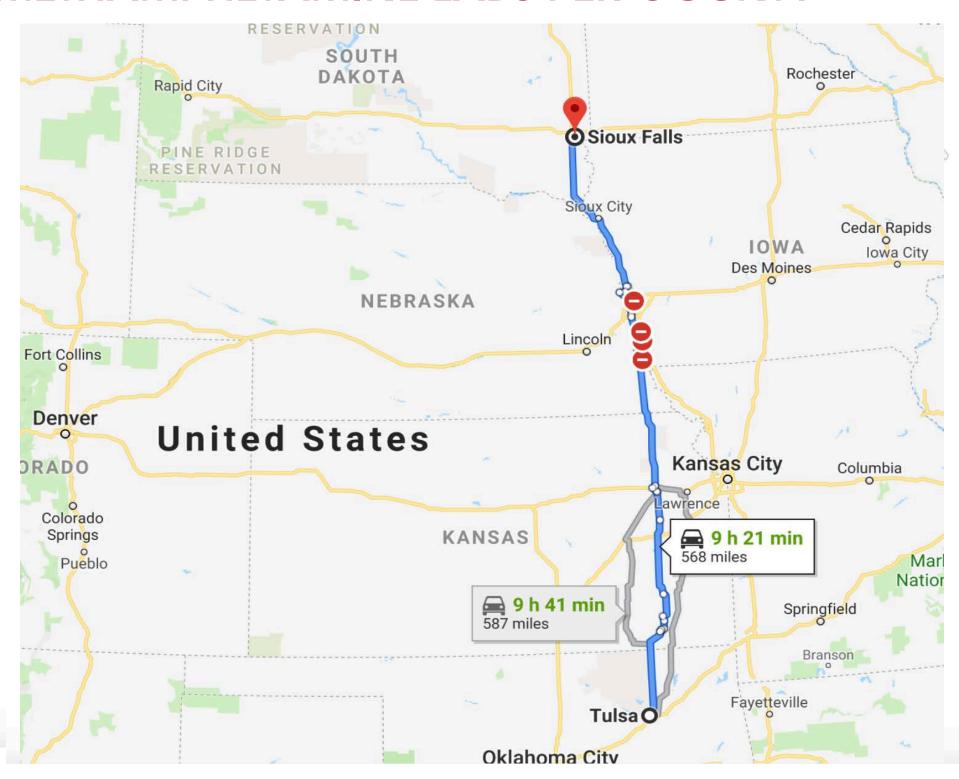


H)
CH₃

Phenylephrine

meta-Hydroxy-1-phenyl-2-aminopropane)

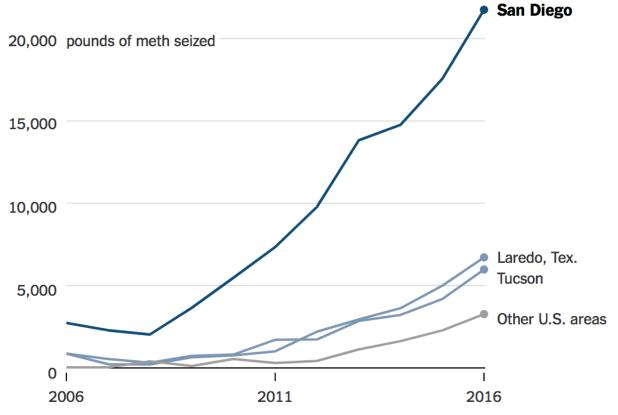
METHAMPHETAMINE LABS PER COUNTY



METHAMPHETAMINE SUPERLABS

Meth Seizures Are on the Rise Across the Nation

The amount of methamphetamine seized by U.S. authorities has been increasing, especially in Southwest field offices.









BACK TO DONELLE'S STORY

- Started using cocaine at age 14
- At age 18, left for Denver and had three children with a man who dealt cocaine
- In 2000, she was arrested and sent to prison and lost custody of her three children



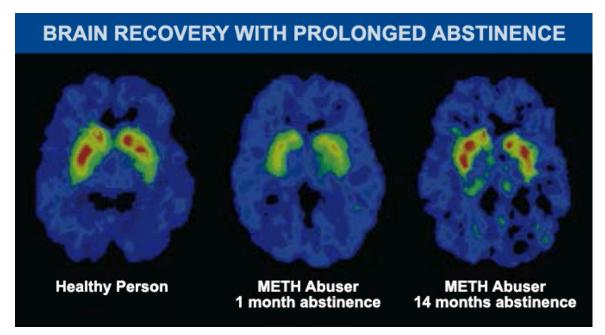
Donelle: "I talk to my oldest kids but they don't really know me and I really don't know them," she said. "I feel like I let them down and I feel guilty for not being there for them. After losing my first three children, I felt like a failure and it intensified my drug use to numb my feelings and not care about anything

EFFECTS OF METHAMPHETAMINE

- Prolonged euphoria from release of dopamine, norepinephrine and serotonin.
 - World's best anti-depressant until..... neurotransmitters are depleted.
- Prolonged use results in permanent depletions of NT, including serotonin, and likely neuronal death which can lead to depression/anxiety.
- Can regenerate-6 months to 1 year.

Women may be at particular risk of grey matter

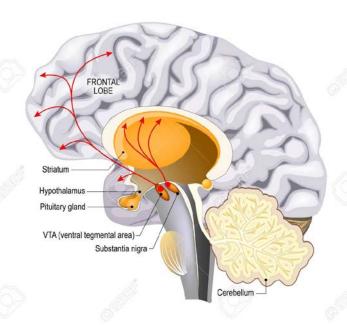
damage.



ADDICTION

- Addiction A primary, chronic disease of brain of the reward, motivation, memory, and related circuitry.
- Dysfunction in these circuits leads to characteristic biological, psychological, social and spiritual manifestations. This is reflected in an individual pathologically pursuing reward and/or relief by substance use and other behaviors.
- Genetic component: 50% of addiction is hereditary.





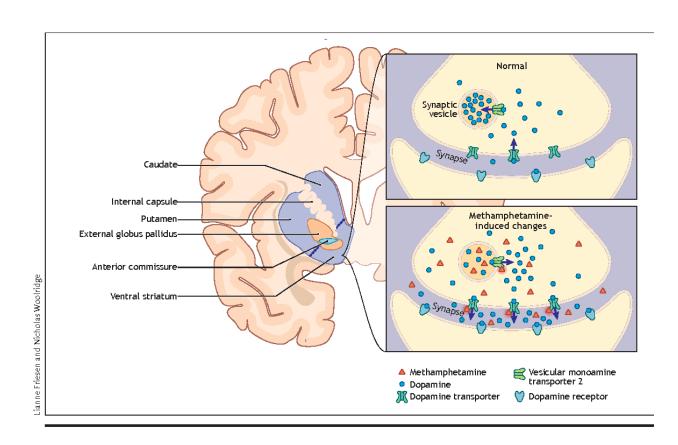






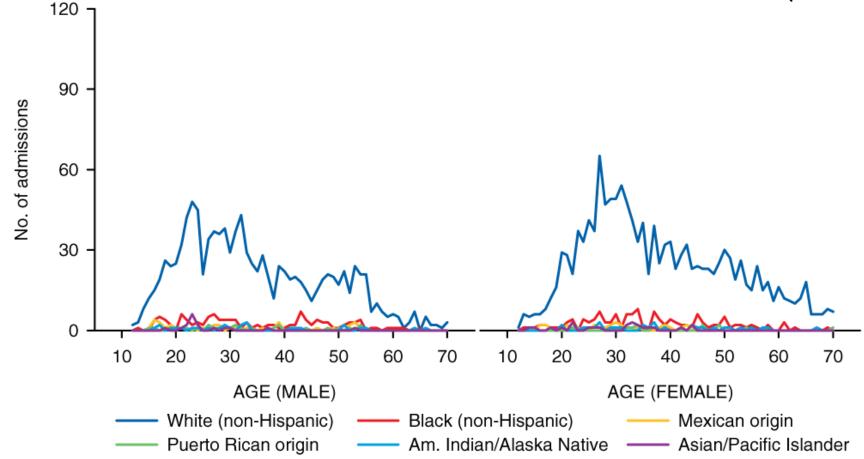
STIMULANT USE DISORDER

 Stimulant use disorder is "the continued use of amphetamine-type substances, cocaine, or other stimulants leading to clinically significant impairment or distress, from mild to severe."



WHAT'S WITH METH AND WOMEN?

- Other substance use disorders favor men
 - Alcohol 3:1
 - Cocaine 2:1
 - Methamphetamine 0.2% of both men and women have used (NSDUH, 2009)
 - Women 45% of meth-related treatment admissions (TEDS, 2012)



SOURCE: Center for Behavioral Health Statistics and Quality, Substance Abuse and Mental Health Services Administration, Treatment Episode Data Set (TEDS). Data received through 10.17.13.

METHAMPHETAMINE AND YOUTH - NATIVE POPULATIONS

- National Longitudinal Study of Adolescent Health (N=14,332; 18–26-year-olds)
- 12.8% of Native American youth had used methamphetamine in the past year
- 3.3% White
- 0.6% African American
- 1.9% Hispanic
- 1.8% Asian

Hormonal sensitivity

 Women may be more vulnerable to the reinforcing effects with estrogen possibly being one factor for this increased sensitivity.

Telescoping

Once exposed,
 women move to use to addiction faster than men.

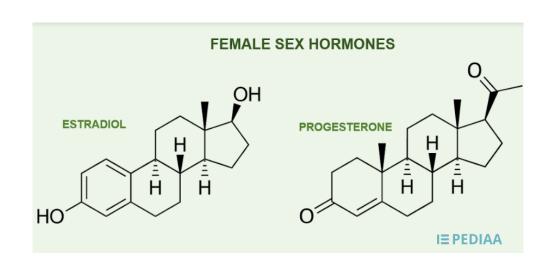
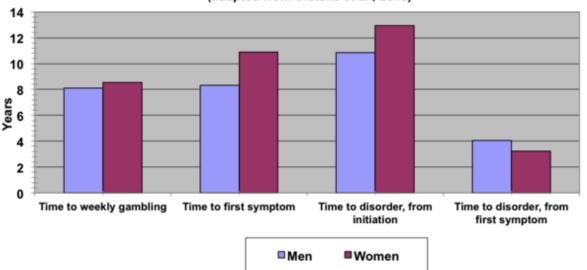


Figure 1. Telescoping Effects by Gender and type of Progression (adapted from Slutske et al., 2015)



- Earlier age at initiation
- Shorter time from first use to regular use
- Initiate with sexual partner

Methamphetamine use behaviors and gender differences

Mary-Lynn Brecht^{a,*}, Ann O'Brien^a, Christina von Mayrhauser^b, M. Douglas Anglin^a

Characteristic	Total ^a [% or	Males [% or	Females [% or	χ^2 or t test	P
	mean (S.D.)]	mean (S.D.)]	mean (S.D.)]	$(df, \text{ if not } 1)^b$	(unadjusted) ^b
Age of first MA use	18.98	19.34	18.54	NS	NS
Age of first WA use	(5.58)	(5.73)	(5.36)	113	113
Years from first MA	2.14	2.56	1.60	2.21	.036
use to regular	(4.15)	(4.66)	(3.33)	(335)	
MA use					
Means of MA initiatio	n				
Friend	59	63	53	9.35 (2)	.009
Spouse or	13	9	20		
boy/girlfriend					
Other	28	28	27		

Weight Loss

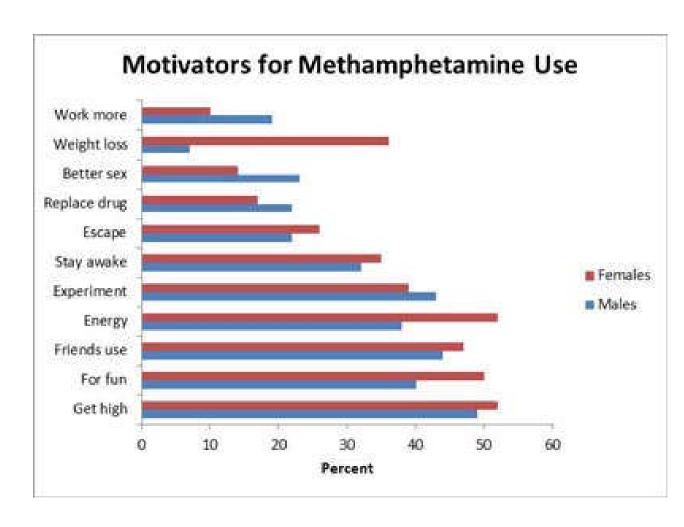
- 36% of women use meth to lose weight
- vs. 7% of men
- Big trigger for relapse postpartum

Energy

- 52% of women use meth to lose weight vs. 38% of men
- Caregiver roles

Methamphetamine use behaviors and gender differences

Mary-Lynn Brecht^{a,*}, Ann O'Brien^a, Christina von Mayrhauser^b, M. Douglas Anglin^a



Trauma informed understanding

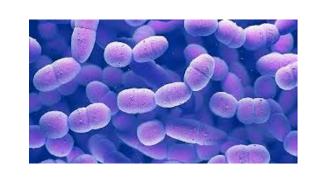
- Interpersonal Violence
 - 55% history childhood abuse or neglect
 - 62.5% history domestic violence
- High rates of co-occurring mental health disorders (44%)
 - Depression (36%)
 - Anxiety (11%)
 - PTSD (14%)
 - Eating Disorders/Bipolar disorder /Personality disorder

Infectious Disease

- HIV, Hepatitis C, Hepatitis B, chlamydia, gonorrhea
- More likely to share needs or straws with partner as sign of shared intimacy







DONELLE IS A WOMAN WITH A STIMULANT SUE DISORDER

- Released on probation before her term was up, but she re-offended.
- In 2003 violated probation, she was pregnant and didn't know it. While serving her sentence, she gave birth and was separated from her daughter after just a few minutes.
- Later, after another release and brief re-imprisonment, Donelle delivered her youngest daughter just two days after being released.



Donelle: "When I got pregnant with my fourth and fifth daughters, I felt like God was giving me another chance to be a mother, and I wanted to make the right choices"

PREGNANCY AND METHAMPHETAMINES

Methamphetamine Use Among Pregnant Women

Mishka Terplan, MD, MPH, Erica J. Smith, MPH, Michael J. Kozloski, MA, MS, and Harold A. Pollack, PhD

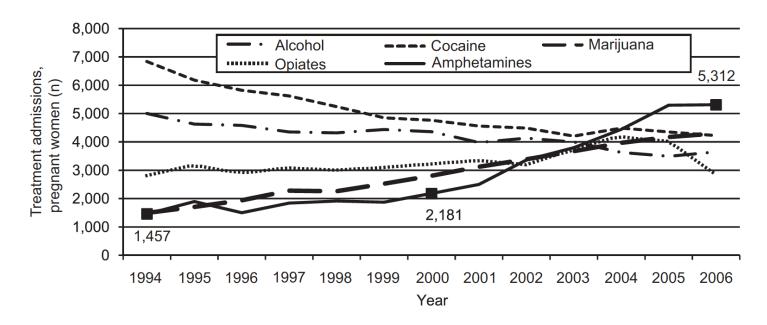
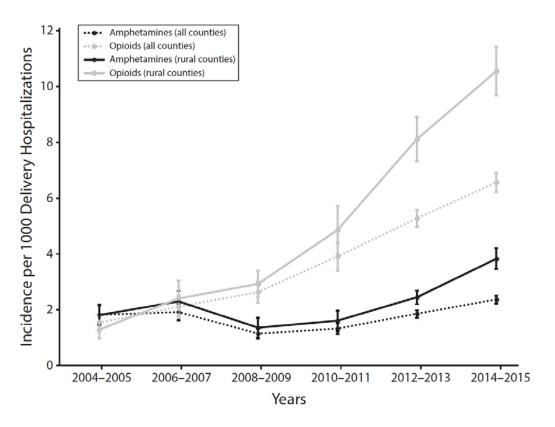


Fig. 1. Primary substance among pregnant women in substance treatment. *Terplan. Methamphetamine Treatment Among Pregnant Women. Obstet Gynecol* 2009.

PREGNANCY AND AMPHETAMINES

Amphetamine- and Opioid-Affected Births: Incidence, Outcomes, and Costs, United States, 2004–2015

Lindsay K. Admon, MD, MSc, Gavin Bart, MD, PhD, Katy B. Kozhimannil, PhD, MPA, Caroline R. Richardson, MD, Vanessa K. Dalton, MD, MPH, and Tyler N. A. Winkelman, MD, MSc



Note. The sample size was n = 47 164 263. All data are survey-weighted and represented as rate per 1000 delivery hospitalizations. Whiskers indicate 95% confidence intervals.

FIGURE 1—National Trends in Amphetamine and Opioid Use Among Delivering Women: National Inpatient Sample, United States, 2004–2015

PREGNANCY AND METHAMPHETAMINES

- Severe preeclampsia
- IUGR
- Maternal cardiac problems/pulmonary edema
- Abruption-more with cocaine
- Preterm Labor
- Complicated by poor prenatal care/poor pregnancy dating

Table 1. Maternal Demographics

	Methamphetamine Users (n=276)	Control Patients (n=34,055)	P *
Age younger than 20 y	25 (9)	5,449 (16)	<.01
Obstetric visits fewer than 5	190 (69)	3,324 (10)	<.001
Hispanic ethnicity Married	152 (55) 34 (12)	24,179 (71) 15,686 (46)	

Data are n (%) unless otherwise specified.

^{*} P from χ^2 test.

CHARACTERISTICS OF WOMEN USING METHAMPHETAMINES

Table 3. Substance Use Characteristics of Pregnant Methamphetamine Admissions

Characteristic	1994	1998	2002	2006	P for Trend
Polysubstance use	1,020 (70.0)	1,310 (68.4)	2,209 (65.7)	3.293 (61.9)	<.001
No. of substances reported	, , ,	, , ,	, , ,	. ,	
1	437 (30.0)	606 (31.6)	1,153 (34.3)	2,019 (38.0)	<.001
2	504 (34.6)	648 (33.8)	1,213 (36.1)	2,451 (46.1)	
3	516 (35.4)	662 (34.6)	996 (29.6)	842 (15.9)	
Criminal justice referral	426 (29.4)	683 (36.8)	1,360 (41.9)	2,157 (40.6)	<.001
Type of treatment					
Detoxification	67(4.6)	138 (7.2)	195 (5.8)	282 (5.31)	<.001
Residential	311 (21.4)	534 (27.9)	1,028 (30.6)	1,685 (31.7)	
Ambulatory	1,079 (74.1)	1,244 (64.9)	2,139 (63.6)	3,345 (63.0)	
Route of use					
Smoke	1,057 (73.5)	1,357 (73.2)	2,417 (73.8)	4,129 (78.3)	<.001
Intravenous	279 (19.4)	411 (22.2)	665 (20.3)	914 (17.3)	
Oral/other	102 (7.1)	87 (4.7)	194 (5.9)	229(4.3)	
Prior treatments					
None	778 (55.7)	846 (49.5)	1,542 (50.4)	2,567 (49.9)	<.001
1-4	596 (42.6)	817 (47.8)	1,396 (45.7)	2,397 (46.6)	
5 or more	24 (1.7)	47 (2.8)	119 (4.0)	182 (3.5)	
Age at first use (y)	, ,	, ,	, ,	, ,	
20 or younger	1,089 (75.6)	1,392 (73.1)	999 (73.5)	4,045 (76.7)	<.001
21–29	306 (21.2)	422 (22.2)	310 (22.8)	1,008 (19.1)	
30–39	45 (3.1)	43 (4.9)	45 (3.3)	211 (4.0)	
40 or older	1(0.1)	4(0.5)	6 (0.4)	7 (0.1)	

Data are n (%).

BIRTH OUTCOMES-METHAMPHETAMINES (WITH GOOD PRENATAL CARE)

TABLE 2. Birth Outcomes of MA-Exposed Pregnancies Compared With Non-MA Exposed Pregnancies

	All	Women (n = 251)	Women With No Other Drug Use (n = 119)			
Outcome	Any MA Use During Pregnancy (n = 144) Mean ± SD	No MA Use During Pregnancy (n = 107) Mean ± SD	P	Only MA During Pregnancy (n = 60) Mean ± SD	No Drug Use During Pregnancy (n = 59) Mean ± SD	P
Gestational age, wk	38.5 ± 2.0	39.1 ± 2.1	0.048	38.8 ± 2.1	39.5 ± 1.6	0.043
Birth weight, g	3159 ± 561	3168 ± 533	0.9	$\sqrt{3103 \pm 537}$	3321 ± 451	0.019
Head circumference, cm	33.5 ± 3.2	33.9 ± 2.9	0.42	33.2 ± 3.4	34.6 ± 1.5	0.01
Length, cm	50.3 ± 3.0	50.6 ± 3.4	0.52	49.8 ± 3.4	51.3 ± 2.5	0.009
Cord pH	7.25 ± 0.1	7.27 ± 0.1	0.18	7.25 ± 0.1	7.27 ± 0.1	0.26
Maternal LOS, d	2.7 ± 1.3	2.4 ± 1.2	0.12	2.52 ± 0.9	2.2 ± 0.8	0.02
Infant LOS, d	3.9 ± 7.0	3.5 ± 4.7	0.62	4.3 ± 7.8	2.5 ± 1.9	0.1
First prenatal visit, wk	23.3 ± 9.5	17.7 ± 9.5	< 0.0001	24.2 ± 9.4	17.2 ± 10.4	0.0009
Number of prenatal visits	7 ± 4.3	8.4 ± 3.9	0.018	7.5 ± 4.4	8.6 ± 4.2	0.22

LOS, length of stay; MA, methamphetamine.

PREGNANCY COMPLICATIONS-METHAMPHETAMINE USE

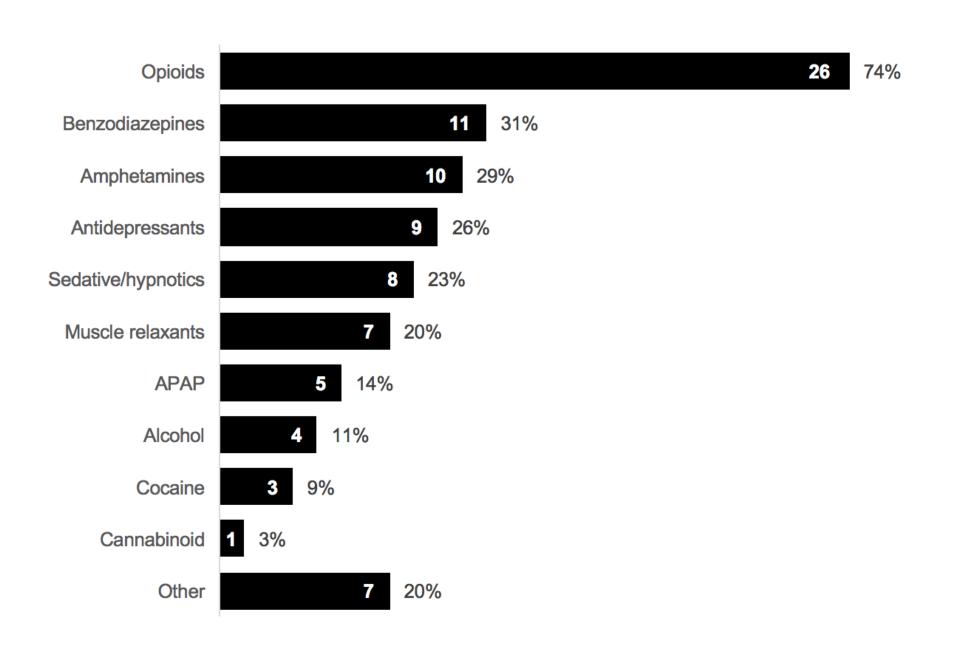
TABLE 3. Unadjusted Associations Between Pregnancy Complications ar	ind MA Use
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	All Women (n = 251)				Women With No Other Drug Use (n = 119)			
Pregnancy Complications	Any MA Use During Pregnancy (n = 144) n (%)	No MA Use During Pregnancy (n = 107) n (%)	OR (95% CI)	P	Only MA During Pregnancy (n = 60) n (%)	No Drug Use During Pregnancy (n = 59) n (%)	OR (95% CI)	P
Preterm delivery	18 (12.6)	13 (12.0)	1.05 (0.5–2.3)	1.00	8 (13)	3 (5)	2.8 (0.7–11.2)	0.2
Low birth weight	15 (10.7)	10 (9.4)	1.2 (0.5–2.7)	0.83	8 (13)	2 (3.4)	4.3 (0.9–21.2)	0.09
Chronic hypertension	11 (7.7)	2 (1.9)	4.4 (0.9–20.2)	0.035	3 (4.9)	0(0)	NA	0.24
Preeclampsia	10 (7.0)	4 (3.7)	1.94 (0.6–6.3)	0.28	4 (6.6)	2 (3.4)	2.0 (0.4–11.5)	0.68
Cesarean delivery	46 (32.2)	15 (12.0)	2.9 (1.5–5.6)	0.0006	12 (19.7)	4 (6.8)	3.4 (1.0–11.1)	0.058
NICU admission	10 (7.3)	10 (9.6)	0.74 (0.3–1.9)	0.63	4 (6.8)	2 (3.6)	1.9 (0.3–11.0)	0.68
Small for gestational age	15 (10.5)	15 (14.0)	0.72 (0.3–1.5)	0.43	8 (13)	6 (10.3)	1.3 (0.4–4.0)	0.78

n and percentages may differ by column because of lack of data on outcome.

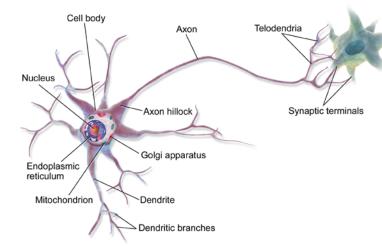
CI, confidence interval; MA, methamphetamine; NICU, newborn intensive care unit; OR, odds ratio.

PREGNANCY AND DRUG RELATED DEATHS IN UTAH 2005-2014



FETAL AND INFANT OUTCOMES

- Methamphetamines are neurotoxic
 - Preferential concentration of metabolites in the fetal brain.
 - Earlier exposure is associated with longer lasting alteration in the serotonergic pathways.



- Sex differences in methamphetamine exposure may start in the fetal period.
 - Male offspring increased risk of drug-induced neurotoxicity as adults.
 - While not correlated with functional differences, methamphetamine-exposed female children had changes in frontal white matter suggestive of altered neuronal and glial development.



IDEAL STUDY

- Infant Development, Environment and Lifestyle study (IDEAL)
- 412 maternal-child pairs (204 methamphetamine exposed versus 208 unexposed pairs) from the United States and New Zealand.





IDEAL STUDY

Neonatal outcomes

- Increased likelihood of admission to the NICU, decreased arousal and increased physiological stress, which subsequently improved at one month of age.
- Early childhood outcomes,
 - At age 3 years, differences in cognitive, behavioral, language and emotional outcomes between exposed and unexposed children were correlated with adverse social environments and not prenatal methamphetamine exposure.
 - At age 3 and 5 years, heavy prenatal methamphetamine exposure (> 3 days per week), increased anxiety/depression and attention problems after controlling for other substances and caregiver/environmental risk factors.

Childhood outcomes

 At age 7.5 years had poorer cognitive function on the Conner's Parent Rating Scale, but not behavioral problems

INFANTS CANNOT HAVE AN ADDICTION



ETHICAL QUESTION

- Should we punish women who cause their babies harm by using drugs?
 - Should we punish women who do not control blood sugars or take hypertensive medications?
- Should we routinely take away babies of mothers who test positive for drugs?
 - Should we routinely take away babies of mothers who smoke?

TRADITIONAL APPROACHES TO ADDICTION IN PREGNANT WOMEN

 Approach #1: Call Child Protective services -women with addiction not fit to parent.



- Approach #2: Arrest her. Then she'll stay clean at least while she's in jail.
 Baby won't be affected.
- Approach #3: Arrest her. Make enrollment in drug treatment a condition of discharge.



MULTI-GENERATIONAL ISSUE

- Period of abstinence (6 years)
- Romantic relationship with a Sioux Falls man who sold drugs.
- Her youngest daughter lived with Donelle's grandmother in Rapid City, who was sick with cancer.
- In 2014, felony ingestion, drawing two concurrent 5-year prison terms.
- In 2017, violated probation and became an escapee by fleeing to Rapid City to see her ailing grandmother.



THE QUESTION – IS MY BABY GOING TO GET TAKEN AWAY?

Fear

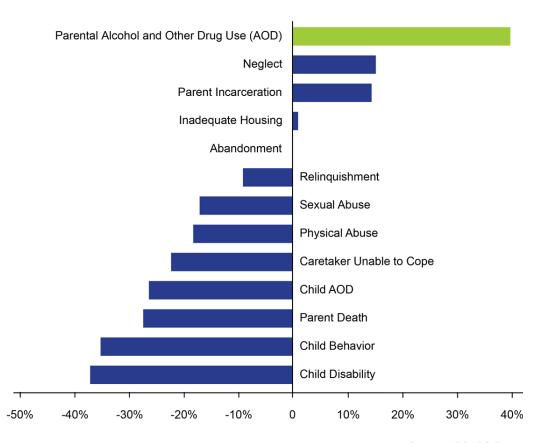
- Discovery, prosecution
- Losing children
- Treatment
- Disapproval, stigma

Other Barriers

- Transportation
- Childcare
- Increase subsequent pregnancy rates
 - "I have a hole in my heart from missing those two months with my son. It makes me want to have another baby to fill it."

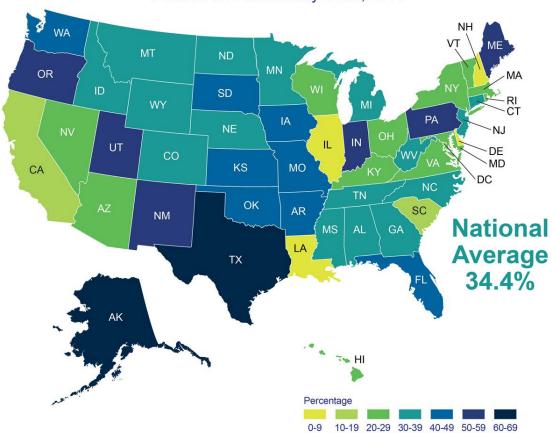


Percentage Change in Reasons for Removal in the United States, 2009 to 2015



Source: AFCARS Data, 2

Parental Alcohol or Other Drug Use as Reason for Removal by State, 2015



Note: Estimates are based on all children in out-of-home care at some point during Fiscal Year.

Source: AFCARS Data, 2016

PROBLEMS WITH CPS REMOVAL

- Every child with "threatened harm" was removed from household.
- "Threatened harm" included exposure to drugs.
- CPS system is overburdened
- More children raised by grandparents
- 17 states consider illicit drug use during pregnancy child abuse

"Removing a child from his/her family may cause serious psychological damage-damage more serious than the harm intervention was supposed to prevent." Michael Wald, 2000.

TRADITIONAL APPROACH #2 ARREST HER. THEN SHE CAN'T USE

- 3 states (Minnesota, South Dakota, Wisconsin) consider drug use during pregnancy grounds for civil commitment.
- TN explicitly criminalized drug use during pregnancy in 2014 (later allowed to sunset.)
- Several studies have demonstrated that legal substance (tobacco and alcohol) are more harmful to infants than illicit drugs.





LESSONS LEARNED FROM SOUTH CAROLINA

- In 1997, Cornelia Witner was prosecuted for child abuse for using crack-cocaine during pregnancy.
- State Supreme Court upheld her conviction.
- Tested without her knowledge or consent.
- After her prosecution:
 - Admissions to drug-treatment dropped by 80%.
 - Increase in infant mortality.
 - 20% increase in abandoned infants



Whitner v. State S.C.,1997.

Supreme Court of South Carolina. Cornelia WHITNER, Respondent,

v.

STATE of South Carolina, Petitioner. **No. 24468.**

RACIAL DISPARITIES

- Paltrow and Flavin (2013) found 348 cases (1973-2005) where women were arrested solely for being pregnant and using drugs and another 380 cases since 2005.
- More white women use substances during pregnancy, especially opioids, methamphetamine alcohol and tobacco



- South Carolina only tested indigent women, not women in private practice settings.
- Of the 384 women found by Paltrow and Flavin, 59% were women of color





TRADITIONAL APPROACH #2: ARREST HER. THEN SHE CAN'T USE

- In most prison, less than 5% of women get mental health care, including substance abuse treatment.
 - Women in prison often don't get adequate prenatal care.
- Women in prison are subjected to abuse, inadequate nutrition, and increased stress, all of which increase pregnancy complications.
- Treatment is much cheaper than prison



TRADITIONAL APPROACH #3: ARREST HER. MAKE HER GET TREATMENT

- Compelling treatment can work well, particularly with men with substance abuse problems
- Woman-specific treatment works much better.
- Not enough treatment facilities ANYWHERE





NOVEL APPROACH

- Co-located prenatal and postpartum services
- CTSA's Pregnancy and Opioids Models of Care (PROMO) study models
- UNC's Horizons Clinic
- University of Hawaii's Path











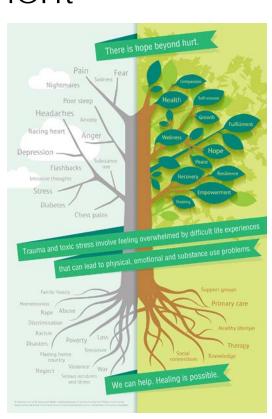


NON TRADITIONAL TREATMENT: FAMILY ORIENTED AND GENDER SPECIFIC TREATMENT

- Trauma-centered care
 - Extremely high rates of childhood sexual trauma in these women
- Because women are much more relationship oriented, may not want residential treatment if separated from children.
 - Needs to provide childcare/transportation

Behavioral treatment

- Cognitive-behavioral therapy (CBT)
- Contingency management, or motivational incentives
- The Matrix Model
- 12-Step facilitation therapy
- Mobile medical application: reSET®



NOVEL TREATMENTS

PROMETRIUM® 100 mg
Go3DA04
Progesterone
capsule molli per uso orale e vaginale
uso orale e VAGINALE

- Micronized progesterone
- Postpartum treatment??

Lancet Psychiatry. 2014 October 1; 1(5): 360–367. doi:10.1016/S2215-0366(14)70333-5.

Progesterone Reduces Cocaine Use in Postpartum Women with a Cocaine Use Disorder: A Randomized, Double-Blind Study

Kimberly Ann Yonkers, M.D.,

Departments of Psychiatry, Obstetrics and Gynecology and School of Epidemiology and Public Health, Yale University School of Medicine,40 Temple Street, Suite 6B, New Haven, Connecticut, USA 06510

POSTPARTUM

- Grief and support counseling for non-parenting mothers
 - Acknowledgement of loss
- Peer support
- Non-judgmental language
 - Person centered language
 - NOT clean or dirty expected or unexpected
 - Discuss relapse and safety plans

Harm reduction

- Peer support
- Relapse prevention
- Relapse discussion
- Extremely high suicide risk



POSTPARTUM

Watch for postpartum relapse triggers

- Postpartum depression
- Fatigue
- Weight gain
- Child welfare issues

Encourage breastfeeding

- Relapse prevention
- Lower estrogen?
- Bonding
- Weight Loss
- Infection control
- Can breast feed with Hepatitis C
 - Contraindicated in HIV or active tuberculosis
 - Active drug use



POST PARTUM

Long-term developmental care for children

Slight increase behavioral problems

Increased rates of depression
 anxiety in the children

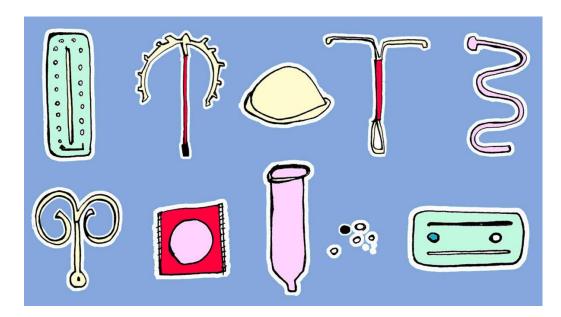
Parenting classes

- Tremendous guilt and shame
- Lack of good role models
- Family disease of addiction
- Preventative for the next generation

POST PARTUM

Contraception

- Long-acting reversible contraception (LARC) in reproductive justice model
- Access to full spectrum of reproductive health including safe abortion care
- Some evidence that progesterone decreases stimulant related cravings



NALOXONE







COULD THINGS HAVE BEEN DIFFERENT FOR DONELLE?

- Eligible for release in October 2019
- Works making quilts, taking prison parenting class
- Moments
 - Her family
 - Age 14, age 18
 - Incarceration



 "My actions will speak louder than my words because I've said so much in the past and let them down,"
 Goings said of her children. "I have to deal with my
 addiction on my own, and if I'm going to do it, I'm
 going to do it and if I'm not, I'm not."

SUMMING IT UP

- Addiction hijacks the brain. Pregnancy can hijack it back.
- Stimulant use disorder is a chronic treatable medical condition and most infants with exposure have normal neurological outcomes.
- Postpartum period is the most critical time for maternal relapse.
- Your words are therapy. Remind women that they are a person first.

QUESTIONS



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