Understanding addiction, drug use and abuse among women

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Disclosure

Members of the planning committee for this activity nor I have any financial, professional or personal relationships that could potentially bias this presentation.
Accreditation

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Purpose statement

This presentation is for health care professionals who care for women with a drug addiction and their infants. The module provides a review of the various terminology used for drug addiction, the magnitude of the problem, treatment options for drug abuse during pregnancy and information about infant short and long-term outcomes reported in the literature.
Activity objectives

After studying this module, nurses will be able to

1. Define the terms substance abuse, drug addiction, substance dependence, physical dependence and tolerance.
2. Identify risk factors for addiction among women.
3. Describe the incidence and potential outcomes of drug abuse during pregnancy.
Terminology

- Drug Addiction
- Tolerance
- Physical dependence
- Substance abuse
- Substance dependence
Drug addiction (The National Institute on Drug Abuse [NIDA], 2012)

A chronic relapsing brain disease that is characterized by compulsive drug seeking and use despite harmful consequences (Fenton, Aivadyn & Hasin, 2013).

- **Brain changes can be long lasting** (American Society of Addiction Medicine, 2011).
- **Genetic, psychosocial and environmental factors can influence the development.**
- **Without treatment, drug addiction is progressive and can result in disability or premature death.**
- **Includes cycles of relapse and remission.**
- **May not include tolerance or withdrawal. This depends on the drug.**
Are babies drug addicted?
Tolerance  (National Institute on Drug Abuse, 2007)

A physiological state characterized by a decrease in the effects of a drug over time.

- Larger doses are needed to get the same effect.
- Psychological as well as physiological factors can be involved:
  - Psychological: user requires the drug to continue to feel good, feel satisfied and avoid discomfort.
  - Physiological: user requires the drug to prevent signs of withdrawal.
Physical dependence  (National Institute on Drug Abuse, 2012b)

A state that occurs from chronic use of a drug where negative symptoms of withdrawal result from abrupt discontinuation of the drug or dose reduction.

- Person has physical as well as psychological symptoms.
- Withdrawal is due to chemical changes in the brain.
- Tolerance to the drug develops.
- Many of the drugs of abuse cause physical dependence.
Substance abuse (Frances, 2010)

A pattern of substance (drug) use that has significant negative physical, social, interpersonal and legal consequences. Does not include tolerance, withdrawal or compulsive uncontrolled use.

Substance abuse includes one of the following in 12 months:
- Performance at work or school suffers due to alcohol or drug use
- Reckless behavior associated with drug or alcohol use that puts self or others in danger (driving while drunk)
- Continued use despite stress on relationships
- Legal, financial or police problems due to drug or alcohol use
Substance dependence (National Institute on Drug Abuse, 2012)

A medical term used to describe the abuse of drugs or alcohol that continues even when problems related to its use develop.

Signs of substance dependence are:
- Tolerance
- Withdrawal
- Continued use despite physical, psychological, family or social problems that result from ongoing drug use
- Similar to physical dependence
Substance abuse and substance dependence

From the American Psychiatric Association’s *Diagnostic and statistical manual of mental disorders*, 4th edition (DSM-4) and 5th edition (DMS-5):

- DSM-4 — Substance use disorders includes two terms:
  - Substance abuse
  - Substance dependence

- DSM-5 change — Substance use disorder combines substance abuse and dependence and looks at it on a continuum of severity *(APA, 2013; National Institute on Drug Abuse, 2012a)*
DSM-5 criteria for substance use disorders
(Harney, 2013)

1. Taking substance in larger amounts or for longer than expected
2. Wanting to stop or cut down use but not able to
3. Spending a lot of time getting, using or recovering from use of the substance
4. Cravings and urges to use the substance
5. Can’t do what is required at home, work or school due to substance use
6. Continuing to use even though it causes problems in relationships
7. Giving up important social, occupational, or recreational activities due to drug use
8. Using substances again and again even when it puts you in danger
9. Continuing to use even thought you know you have a physical or psychological problem that could have been made worse by the substance
10. Needing more of the substance to get the effect you want (tolerance)
11. Developing withdrawal symptoms which can be relieved by taking more of the substance
What terminology should we use?

- Drug Addiction
- Physical dependence
- Substance abuse
- Substance dependence
Review: What terminology should we use?

Substance abuse
- Pattern of drug use
- Does not include tolerance or withdrawal
- Reckless behavior

Physical dependence
- Chronic use
- Withdrawal and tolerance
- Does not mean person is addicted

Substance dependence
- Tolerance and withdrawal
- Continued use despite physical, psychological consequences

Drug addiction
- Chronic brain disease
- Continued use despite physical, psychological consequences
- Relapse/Remission
- Can cause death or disability without treatment
- May cause tolerance/withdrawal
Past month illicit drug use among persons > 12 years old

- **Illicit Drugs**: 24.6 million
  - Marijuana: 19.8 million
  - Psychotherapeutics: 6.5 million
  - Cocaine: 1.5 million
  - Hallucinogens: 1.3 million
  - Inhalants: 0.5 million
  - Heroin: 0.3 million

9.4 percent of individuals > 12 years of age used illicit drugs
15.9 percent used marijuana plus other drugs
1.7 percent used pain pills; 0.5 percent used stimulants and 0.1 percent used sedatives

National Survey on Drug Use and Health, 2013

Illicit drugs include marijuana/hashish, cocaine (including crack), heroin, hallucinogens, inhalants, or prescription-type psychotherapeutics used non-medically.

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## Comparison of drugs used: 2010 to 2013

<table>
<thead>
<tr>
<th>Drug</th>
<th>2013</th>
<th>2012</th>
<th>2011</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Illicit</td>
<td>9.4%</td>
<td>9.2%</td>
<td>8.7%</td>
<td>8.9%</td>
</tr>
<tr>
<td>Marijuana</td>
<td>7.5%</td>
<td>7.3%</td>
<td>7.0%</td>
<td>6.9%</td>
</tr>
<tr>
<td>Psychotherapeutics</td>
<td>2.5%</td>
<td>2.7%</td>
<td>2.4%</td>
<td>2.7%</td>
</tr>
</tbody>
</table>

SAMHSA, 2012; 2013
Illicit drug use by age

Past month illicit drug use among persons aged 12 or older, by age: 2012 to 2013

SAMHSA, 2013
Gender (SAMHSA, 2013)

- Illicit drug use for ages 12 years or older was higher for males than females (11.5 percent vs. 7.3 percent)
- Children ages 12 - 17 years of age:
  - Illicit drug use was higher for males (9.6 percent) compared to girls (8 percent)
  - *Females aged 12 to 17 years old were slightly more likely than males to be nonmedical users of psychotherapeutic drugs (2.4 percent vs. 2 percent)
  - Marijuana use 7.9 percent for males and 6.2 percent in females

* Percentage for females is down from 3.2 percent in 2012
## Illicit drug use in pregnancy

<table>
<thead>
<tr>
<th>Age</th>
<th>2012 to 2013</th>
<th>2010 to 2011</th>
<th>2008 to 2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>15 to 17</td>
<td>16 percent</td>
<td>20.9 percent</td>
<td>15.8 percent</td>
</tr>
<tr>
<td>18 to 25</td>
<td>8.6 percent</td>
<td>8.2 percent</td>
<td>7.1 percent</td>
</tr>
<tr>
<td>26 to 44</td>
<td>3.2 percent</td>
<td>2.2 percent</td>
<td>2.3 percent</td>
</tr>
<tr>
<td>15 to 44</td>
<td>Not reported</td>
<td>5 percent</td>
<td>Not available</td>
</tr>
</tbody>
</table>

SAMHSA, 2012, 2013
NIDA: Prenatal exposure to drugs of abuse, 2011

Current Substance Use Among Pregnant Women
Aged 15-44, by Age, 2008-2009 Combined

Source: SAMHSA, NSDUH, 2010
Maternal opioid use in the United States
(Patrick, et al., 2012)

- Weighted national estimates of maternal opioid use per 1,000 hospital births per year
- Time frame
  - 2000 to 2009
  - Steady increase
  - The number of mothers using or dependent on opioids increased from 1.9 percent in 2000 to 5.63 per 1000 hospital births per year
Prescription narcotic use during pregnancy at Mayo Clinic: 5- to 6-fold increase in 12 years

Nonmedical use of opioid pain relievers (OPRs)  
(SAMHSA, 2012, 2013)

Prescription drug abuse of OPRs is a growing national epidemic.

Between 2002 and 2012:

- The number of persons dependent on OPRs for nonmedical use increased from 1.9 to 2.5 million.
- The number of persons in treatment increased from 199,000 to 438,000.

In 2013:

- 1.5 million persons 12 years of age or older reported nonmedical use of pain relievers
- Average age of first nonmedical use was 21.7 years
Nonmedical use of OPRs  (Centers for Disease Control, 2013)

- Deaths from OPRs increased 5-fold between 1999 and 2010 for women.
- More women have died each year from drug overdoses than from motor vehicle accidents.
- In 2010, enough OPR’s were prescribed to medicate every adult in the United States with a typical dose of 5 mg. of hydrocodone taken every 4 hours for 1 month.
Cost of nonmedical use of prescription opioids
(Hansen et al. 2011)

In 2006, the estimated total cost in the United States of nonmedical use of prescription opioids was $53.4 billion.

<table>
<thead>
<tr>
<th>Category</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lost productivity</td>
<td>$42 billion</td>
</tr>
<tr>
<td>Criminal justice</td>
<td>$8.2 billion</td>
</tr>
<tr>
<td>Drug abuse treatment</td>
<td>$2.2 billion</td>
</tr>
<tr>
<td>Medical complications</td>
<td>$944 million</td>
</tr>
</tbody>
</table>
Alcohol and tobacco use (SAMHSA, 2013)

Alcohol and tobacco use for women aged 15 to 44

- Alcohol use
  - Non-Pregnant women: 55.4 percent
  - Pregnant women: 9.4 percent
    - First trimester 19 percent
    - Second trimester 5 percent
    - Third trimester 4.4 percent

- Tobacco use
  - Non-Pregnant women: 24 percent
  - Pregnant women: 15.4 percent
Women (aged 18 to 44 years) past month alcohol use rate by pregnancy, trimester and age of youngest child in the household: 2002 to 2007 compared to 2013

<table>
<thead>
<tr>
<th>2002 to 2007</th>
<th>2013: Age 15-44</th>
</tr>
</thead>
<tbody>
<tr>
<td>NP, No Child</td>
<td>63.0</td>
</tr>
<tr>
<td>Trimester 1</td>
<td>19.0</td>
</tr>
<tr>
<td>Trimester 2</td>
<td>7.8</td>
</tr>
<tr>
<td>Trimester 3</td>
<td>6.2</td>
</tr>
<tr>
<td>NP, Child &lt;3 months</td>
<td>31.9</td>
</tr>
<tr>
<td>NP, Child 3-5 months</td>
<td>43.9</td>
</tr>
<tr>
<td>NP, Child 6-8 months</td>
<td>46.4</td>
</tr>
<tr>
<td>NP, Child 9-11 months</td>
<td>52.1</td>
</tr>
<tr>
<td>NP, Child 12-14 months</td>
<td>49.4</td>
</tr>
<tr>
<td>NP, Child 15-17 months</td>
<td>54.9</td>
</tr>
<tr>
<td>NP, Child 18+ months</td>
<td>52.1</td>
</tr>
</tbody>
</table>

SAMHSA, 2009, 2013
Women past month cigarette use rate by pregnancy, trimester and age of youngest child in the household: 2002 to 2007 compared to 2013

<table>
<thead>
<tr>
<th>2002 to 2007: Age 18 to 44</th>
<th>2013: Age 15 to 44</th>
</tr>
</thead>
<tbody>
<tr>
<td>NP,* No Child</td>
<td>33.3</td>
</tr>
<tr>
<td>Trimester 1</td>
<td>21.8</td>
</tr>
<tr>
<td>Trimester 2</td>
<td>14.4</td>
</tr>
<tr>
<td>Trimester 3</td>
<td>13.9</td>
</tr>
<tr>
<td>NP, Child &lt;3 months</td>
<td>20.4</td>
</tr>
<tr>
<td>NP, Child 3-5 months</td>
<td>22.3</td>
</tr>
<tr>
<td>NP, Child 6-8 months</td>
<td>25.2</td>
</tr>
<tr>
<td>NP, Child 9-11 months</td>
<td>24.1</td>
</tr>
<tr>
<td>NP, Child 12-14 months</td>
<td>23.7</td>
</tr>
<tr>
<td>NP, Child 15-17 months</td>
<td>27.1</td>
</tr>
<tr>
<td>NP, Child 18+ months</td>
<td>30.3</td>
</tr>
<tr>
<td></td>
<td>24 percent</td>
</tr>
<tr>
<td></td>
<td>19.9 percent</td>
</tr>
<tr>
<td></td>
<td>13.4 percent</td>
</tr>
<tr>
<td></td>
<td>12.8 percent</td>
</tr>
</tbody>
</table>

* NP = Nonpregnant

Source: 2002 to 2007 SAMHSA National Surveys on Drug Use and Health (NSDUHs)
Women (aged 15 to 44 years) cigarette smoking 2002 to 2013

Figure 4.5 Past Month Cigarette Use among Women Aged 15 to 44, by Pregnancy Status: Combined Years 2002-2003 to 2012-2013

* Difference between this estimate and the 2012-2013 estimate is statistically significant at the .05 level.

SAMHSA, 2013
Drug addiction

Key factors

- Psychosocial
- Genetic
- Environmental
Psychosocial factors of addiction

- Physical and sexual abuse
  - PTSD (post traumatic stress disorder)
  - Anxiety
- Depression
Physical and sexual abuse

- **Child abuse**
  - 686,000 children were victims in 2012
  - 75 percent suffered neglect
  - 15 percent suffered physical abuse
  - 10 percent suffered sexual abuse
  (U.S. Department of Health & Human Services, Children’s Bureau, 2012)

- **Young girls who were sexually abused**
  are 3 times more likely to develop psychiatric disorders or alcohol and drug abuse in adulthood
  (Kendler, et al., 2000).

- **70 to 80 percent of sexual abuse survivors** report excessive alcohol and drug use
  (Day et al., 2003; Voeltanz, et al., 1999)
Physical and sexual abuse (continued)

- **Women abused as children** are more likely to abuse substances than non-abused children.
  - Two-thirds of women in treatment for drug abuse reported being neglected or abused as children (Swan, 1998).
  - More than one-third of adolescent girls who report abuse or neglect have a problem with substance abuse before their 18th birthday (Wilson et al., 2012).
  - 90 percent of juvenile sexual abuse victims know their perpetrator (Snyder, 2000).

- In a study of 111 females in a detox unit in Boston (Liebschultz et al., 2002):
  - Eighty-one percent reported physical/sexual abuse that started at 13 years of age.
  - Consequences of this experience lead to substance abuse.
National intimate partner and sexual violence survey  (Black, et al, 2011)

- 9,086 women in the US responded to survey
  - 33 percent reported experiencing physical violence by an intimate partner
  - 18 percent reported being raped at some time in their lives
  - Of those who reported being raped, 51 percent were raped by an intimate partner; 41 percent were raped by an acquaintance
PTSD (Souza & Spates, 2008)

- Women who go through trauma have higher risk of abusing alcohol.
- Women who abuse alcohol and drugs are more likely to have been sexually abused.
- Individuals who have PTSD and drinking problems also have mental illness issues such as:
  - Panic attacks
  - Depression
  - Abuse of prescription or street drugs
  - Sleep problems
Depression (National Alliance on Mental Illness, 2009)

- One in eight women have a major depression in their lifetime.
- Many factors can contribute to depression in women:
  - Biological – hormones
  - Genetics – 25 percent risk if present in first degree relatives
  - Psychosocial
    - Stress
    - Physical and sexual abuse
    - Traumatic life experiences
    - Poverty
    - Lack of social support
    - Sexual discrimination
Depression (continued)

- Women who are at high risk for depression are more likely to abuse drugs (Layde, 2014).
- Women who are physically or sexually abused are at a higher risk of depression (National Alliance on Mental Illness, 2009).
Genetic factors of addiction  
(Kendler, et al., 2000a)

- Combination of genetics and the environment
- Twin studies (monozygotic (MZ) and dizygotic (DZ))
- Heritability of substances includes the following:
  - Alcohol — 50 to 60 percent in MZ and in DZ twins (9,000 pairs of MZ & DZ twins)
  - Opioids — 13.3 percent in MZ twins; 2.9 percent DZ twins (30 pairs of each)
  - Stimulants — 14.1 percent for MZ twins (21/149); 5.3 percent DZ twins (6/113)
  - Tobacco — greater than 60 percent in both male and female MZ twins compared to 20 percent in DZ twins (778 male-male and female-female pairs)

(Kendler et al., 2000b)
Environmental factors of addiction

- **Peers** (Bauman & Ennett, 1998)
  - Friendship circles

- **School** (Mrug, et al., 2010)
  - Cigarettes
  - Marijuana
  - Alcohol

- **Parents** (Bahr et al., 2005)
  - Poor parenting practices

- **Family Members** (McCutcheon, et al., 2013)
  - Siblings
  - Parents
Potential outcomes of nicotine use

- Pregnancy
  - Increase in preeclampsia and gestational hypertension. Result is from the combustion of ingredients, not the nicotine. (Wikstrom, et al., 2010)
  - Risk of stillbirth (Wisborg et al., 2001)
  - Ectopic pregnancy (Cnattingius, 2004)
  - Placenta previa (Cnattingius, 2004)
Potential outcomes of nicotine use (continued)

- **Fetus**
  - Preterm birth (<37 weeks gestational age [GA]) (Melville, 2010)
  - Caffeine and smoking (Wisborg, et al., 1996)
    - < 400 mg caffeine per day: no difference in rate of preterm birth between smokers and non-smokers
    - > 400 mg caffeine per day: 3X increase in the rate of preterm birth in smokers
      - Smoked 1 to 5 cigarettes per day, no increased risk
      - Smoked 6 to 10 cigarettes per day, 3X the risk
      - > 10 cigarettes per day, 5X the risk
  - Slow fetal growth and low birth weight (Lemley, 1987)
    - Mean decrease: 187 g (70 to 242 g) (U.S. Department Health & Human Services [USDHHS], 1990)
    - Decrease seen if smoking continued past 30 weeks GA (Hebel, et al., 1988)
  - Oral facial clefts (Little et al., 2004)
Potential outcomes of nicotine use (continued)

- **Infant** (Schuetze and Eiden, 2007)
  - Deficits in self-regulation
  - 2 to 4 Weeks and 7 Months of age
    - Sadness
    - Decreased soothability
    - Fear during a test used to assess emotional self-regulation

- **Child** (Weissman, et al., 1999)
  - Behavioral problems: aggressiveness, over-activeness
  - ADHD
  - Conduct disorder
  - Nicotine dependence later in life (Hellstron-Lindahl & Nordberg, 2002)
    - Adolescents: 5-fold increase in drug abuse/dependence in girls whose mothers smoked 10 or more cigarettes daily during pregnancy (Weissman, et al., 1999)
Potential outcomes of cocaine use

- Pregnancy
  - Nutritional and vitamin deficiency (appetite suppressant) (Bear, 1995)
  - Inadequate eating and sleeping
  - No prenatal care
  - Lifestyle (violence, infectious diseases) (Bauer, et al., 2005)
  - Poor weight gain
  - Cardiac complications (hypertension, arrhythmia, stroke) (Vidaeff & Mastrobattista, 2003)
  - Placenta abruption, preterm labor and delivery (Fajemirokum-Odudeyi & Lindow, 2004)
  - Seizures (Kuczkowski, 2003)
Potential outcomes of cocaine use (continued)

- Fetus —
  - Reports from the 1980’s to 2002
  - Congenital anomalies (Bingol, et al., 1987)
  - Decreased head circumference
    - Dose related (Bateman & Chiriboga, 2000)
    - Central nervous system (CNS) infarction (Chasnoff, et al., 1986)
  - Seizures (Kramer et al., 1990)
  - Limb deformities (Hoyme, et al., 1990)
  - Gastrointestinal and genitourinary abnormalities (Rosenstein et al., 1990; Porat et al., 1991)
  - Prematurity (Bada, et al., 2002)
  - Growth restriction (Bada, et al., 2002)
  - Low birth weight (Bada, et al., 2002)
Potential outcomes of cocaine use (continued)

- Infant – The Maternal Lifestyle Study (Bauer, et al., 2002) started in 1990
  - Look at long term effects of cocaine exposure
  - Four hospitals recruited from the NICHD Neonatal Research Network
  - 717 babies exposed
  - None of these babies had congenital anomalies
  - Mild signs of irritability, jitteriness, tremors - these were related to drug effects
Potential outcomes of cocaine use (continued)

- Child – 2010 review of 32 studies (Ackerman, Riggins & Black, 2010)
  - Children up to age 6 years of age
  - Associations between prenatal cocaine exposure and growth, cognitive ability, academic performance, and language functioning were small
  - Problems with sustained attention and behavioral self-regulation
  - Influenced by environmental factors

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  - Children up to age 6 years of age
  - Associations between prenatal cocaine exposure and growth, cognitive ability, academic performance, and language functioning were small
  - Problems with sustained attention and behavioral self-regulation
  - Influenced by environmental factors
Potential outcomes of marijuana use

- Pregnancy
  - Heavy use: preterm birth by 1 to 2 weeks (Fried, Watkinson, Willan, 1984)
  - Bleeding in third trimester (Linn et al., 1983)
  - Preterm labor (Linn et al., 1983)
  - Difficulty conceiving (Bear, 1995)
  - Spontaneous abortion (Bear, 1995)
  - Precipitous delivery (Bear, 1995)
  - Tachycardia/Hypertension (Bear, 1995)
  - Poor weight gain (Bear, 1995)
  - Anemia (Bear, 1995)
  - Ectopic pregnancy (Bear, 1995)

- Fetus (Hatch & Bracken, 1986)
  - Low-birthweight (< 2500)
  - Small for gestational age (SGA)
Potential outcomes of marijuana use (continued)

- Infant (Fried, 1995)
  - Mild withdrawal
  - Poor autonomic control (particularly state regulation)
    - Normal by 6 months of age
Potential outcomes of marijuana use (continued)

- **Child**
  - Verbal and memory tests
    - 36 months: no effect (Fried et al., 1990)
    - 48 months: poor memory; resolved by 6 years (Fried & Watkinson, 1990)
    - 6 years: no differences when tested for memory and verbal skills (marijuana, cigarettes, alcohol) (Fried et al., 1992)
  - Childhood leukemia - high risk (Fried et al., 1992)
  - **Eye Problems** (Fried et al., 1992)
    - Myopia
    - Strabismus
    - Abnormal ocular motor function
Potential outcomes of opioid use

- **Pregnancy**
  - Uncontrolled heroin use (Center for Substance Abuse Treatment, 2008)
    - Fetal growth restriction
    - Placental abruption
    - Preterm labor
    - Intrauterine passage of meconium
    - Fetal death
  - Other opioids
    - First trimester use of codeine: congenital heart defects (Bracken, 1986)
    - Prenatal exposure to oxycodone, propoxyphene or meperidine: no increase in birth defects (Bracken & Halford, 1981).
  - Lifestyle changes: Sexually transmitted diseases (American College of Obstetrics & Gynecology, 2012)
Potential outcomes of opioid use (continued)

- **Fetus** (Baer, 1995)
  - Premature birth
  - Meconium staining
  - IUGR
  - Smaller head circumference
  - NAS
  - SIDS
  - Apnea
Potential outcomes of opioid use  (continued)

- **Infant** (Lester et al., 2002)
  - High muscle tone
  - Increased irritability
  - Inconsolability
  - Sneezing
  - Excessive sucking
  - Poor sucking ability
  - High-pitched cry
Potential outcomes of opioid use (continued)

- **Child**
  - No teratogenic effects
  - No long term effects on growth
    (Shankaran, et al., 2007)
  - First 2 years of life (Hans & Jeremy, 2001)
    - Poorer scores on Bayley Mental and Psychomotor Scales and Infant Behavior Record ratings of mental and motor functioning
    - No changes during infancy
    - By 2 years of age, changes associated with
      - Poor mental development — socioeconomic risk factors
      - Psychomotor decline — reduced birth weight
  - Older studies
    - Hyperactivity and short attention span at 2 years of age
      (Rosen & Johnson, 1985)
    - Memory and perception problems in older children
      (Lifschitz & Wilson, 1991)
Treatment of opioid addiction in pregnancy: Methadone *(Center for Substance Abuse Treatment, 2008)*

Used as treatment for heroin addiction in the 1970’s. Now used for all opioid addictions.

- **Benefits**
  - Prevents complications of opioid use and narcotic withdrawal
  - Encourages prenatal care
  - Reduces criminal activity
  - Less association with drug culture may decrease recidivism

- **Dose**
  - Adjusted during pregnancy to prevent withdrawal
  - Starting dose 10 to 30 mg/day
  - Neonatal withdrawal is not dose dependent *(Cleary et al., 2010)*.
Treatment of opioid addiction in pregnancy: Buprenorphine (Subutex) (Johnson, Jones & Fisher, 2003)

- **Advantages**
  - Lower risk of overdose
  - Fewer drug interactions
  - Treatment on an outpatient basis not in a treatment program
  - Less neonatal abstinence syndrome (NAS) - Controversial

- **Disadvantages**
  - Hepatic dysfunction
  - No long term data on infant and child effects
  - High drop out rate — limited drug performance
  - Increased risk of sharing or selling buprenorphine

- Buprenorphine + naloxone = suboxone
Treatment of opioid addiction in pregnancy: Buprenorphine (Subutex) (Lintzeris et al, 2001)

- Dosing is typically based on methadone equivalent dosing

<table>
<thead>
<tr>
<th>Methadone</th>
<th>≤ 10 mg</th>
<th>10 to 20 mg</th>
<th>20 to 40 mg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buprenorphine</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Starting dose</td>
<td>2 mg</td>
<td>4 mg</td>
<td>4 mg</td>
</tr>
<tr>
<td>Second day</td>
<td>2 to 4 mg</td>
<td>4 to 8 mg</td>
<td>6 to 10 mg</td>
</tr>
<tr>
<td>Third day</td>
<td>6 to 8 mg</td>
<td>8 to 12 mg</td>
<td>10 to 16 mg</td>
</tr>
</tbody>
</table>

- Attain maintenance dose in 1 to 2 weeks
- Adjust dose Q 3 to 7 days
- Increase dose by 2 to 4 mg increases
- Decrease dose by 2 mg decreases
- Maximum dose - 32 mg/day
- Buprenorphine when taken with sedatives such as benzodiazepines and alcohol can cause fatal overdoses.
Treatment of opioid addiction in pregnancy: Buprenorphine (Subutex)

Study of 23 pregnant women (O’Connor et al., 2011)

- First trimester — 2 to 16 mg/day (average 7.9 mg)
- Second trimester — mean daily dose increased 11.1 mg (range 3 to 16 mg)
- Delivery — mean daily dose was 13.3 mg (range 3 to 24 mg)
- 70 percent of the sample required dose increases — 16/23 women
  - In these women the mean increase in dose over the pregnancy was 5.9 mg.
MOTHER Study (Maternal opioid treatment: Human experimental research)

Pregnant women treated with either methadone or buprenorphine; double-blind, double-dummy study. Findings (Jones, et al., 2010):

- Babies (131 babies: 73 methadone; 58 buprenorphine)
  - Percent of neonates needing treatment not significantly different between groups (p = 0.26)
  - No difference in peak NAS scores (p = 0.04)
  - In the buprenorphine group:
    - 89 percent less treatment with morphine: mean total dose was lower (.1 mg vs. 10.4 mg) (p = 0.0091)
    - 43 percent less time in the hospital: 10 days vs. 17.5 days (p = 0.0091)

- Mothers
  - Women on methadone should stay on methadone.
  - Consider offering buprenorphine if new to treatment, refuse methadone or methadone is not available.
Potential outcomes of alcohol use

First look at alcohol amounts. All are considered to be one standard drink.

| 12 fl oz of regular beer | = | 8-9 fl oz of malt liquor (shown in a 12-oz glass) | = | 5 fl oz of table wine | = | 3-4 oz of fortified wine (such as sherry or port; 3.5 oz shown) | = | 2-3 oz of cordial, liqueur, or aperitif (2.5 oz shown) | = | 1.5 oz of brandy (a single jigger or shot) | = | 1.5 fl oz shot of 80-proof spirits ("hard liquor") |

| about 5% alcohol | about 7% alcohol | about 12% alcohol | about 17% alcohol | about 24% alcohol | about 40% alcohol | about 40% alcohol |

National Institute on Alcohol and Alcoholism, 2014
Potential outcomes of alcohol use

How much is too much?

- **Pregnancy** (Hankin & Sokol, 1995)
  - May cause damage to the fetus
  - Average of more than one drink per day (0.6 oz pure alcohol)
  - Binge drinking (≥ five drinks at one time)

- **General damage related to heavy drinking** (≥ five drinks on the same occasion on each of 5 or more days in the past 30 days)
  - Different findings: one drink per day prenatally can lead to negative outcomes in children (Sood, et al., 2001)

- **Fetus** (Patra, et al., 2011)
  - Low birthweight and SGA: no effect up to 1 drink per day
  - Preterm birth: no effect up to 1.5 drinks per day
  - All three increased with heavy drinking
CDC website, September 13, 2011

Drinking while pregnant still a problem

Alcohol use during pregnancy can cause birth defects and developmental disabilities. Women who are pregnant or might get pregnant should abstain from using alcohol [http://www.cdc.gov/features/dsalcoholchildbearingagewomen/index.html](http://www.cdc.gov/features/dsalcoholchildbearingagewomen/index.html)
**Fetal alcohol spectrum disorder (FASD)**
*(Fetal Alcohol Spectrum Disorders Center for Excellence, 2013)*

- Umbrella term
- Group of disorders that can occur in a person whose mother drank alcohol during pregnancy

<table>
<thead>
<tr>
<th>Different terms to describe FASD</th>
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| **Fetal alcohol syndrome (FAS)** | • Abnormal facial features (smooth philtrum, thick upper lip, short palpebral fissure length  
• Growth problems  
• CNS problems  
• Learning, memory, attention span, communication, vision or hearing |
| **Alcohol related neurodevelopmental disorder (ARND)** | • Intellectual disabilities  
• Problems with behavior and learning |
| **Alcohol related birth defects (ARBD)** | Problems with heart, kidneys, bones or hearing |
Conclusion

1. The terms substance abuse, addiction, substance dependence, physical dependence and tolerance are all related to the chronic use of a drug despite its harmful effects.
2. Newborn infants are not born addicted to drugs.
3. Tobacco and alcohol are the most frequently used substances during pregnancy.
4. Prescription opioid use among pregnant women is increasing.
5. Factors that may contribute to drug and alcohol use include sexual and physical abuse, PTSD, depression and environmental influences.
6. All substances used during pregnancy can have negative effects on pregnancy as well as short and long term outcomes for infants and children.
About the author

Karen D’Apolito, PhD, APRN, NNP-BC, FAAN

Dr. D’Apolito is a professor and program director of the neonatal nurse practitioner program at the Vanderbilt University School of Nursing. She has made national and international contributions to the care of drug-exposed infants through both education and research. She developed a unique inter-observer reliability program to train healthcare professionals in assessing infants for signs of drug withdrawal. She has published several articles related to neonatal drug addiction in referred journals. In 2008, she received the National Perinatal Association's Individual Contribution to Maternal Child Health Award for her work to improve the care of drug-affected infants. Dr. D’Apolito has been a coinvestigator on two multisite federally funded grants involving infants with intrauterine drug exposure and she has been invited to speak nationally and internationally on the topic of addiction in pregnancy and neonatal abstinence.
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Understanding addiction, drug use and abuse among women

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