

The Substance Exposed Newborn Alphabet Soup SEN, NAS, NOWS, OUD, SUD & MAT

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Disclosures

- I have no financial Disclosures

Objectives

- Prenatal Drug Use/Intrauterine Drug Exposure
- Arizona Data
- The Substance Exposed Newborn (SEN)
- Neonatal Abstinence Syndrome (NAS)
- Neonatal Opioid Withdrawal Syndrome (NOWS)
- Opioid Use disorder (OUD)/Substance Use Disorder (SUD)
- Medication Assisted Treatment (MAT)
- Breast feeding concerns

Prenatal Drug use - Intrauterine Drug exposure

- Impaired fetal growth
- Prematurity
- Neurobehavioral impairment
- Regulatory impairment
- Behavioral changes
- Developmental Delays
- Sudden Infant Death Syndrome (SIDS)
- Increased risk of Child abuse

MacMahon JR. Perinatal Substance Abuse: The Impact of Reporting Infants to Child Protective Services. *Pediatrics* 1997 100(5)e1-9

Parental/Prenatal Drug use

Very often more than one drug is abused.

- The child's medical /behavioral/cognitive issues are frequently the result of exposure to multiple drugs
 - Tobacco
 - Alcohol
 - Marijuana
 - Stimulants- Cocaine/Methamphetamines
 - Opioids/Heroin

Arizona Data: 2008 – 2014 Substance Exposed Infants

- In 2014, 1,671 children < 1 year of age were discharged from the hospital or emergency department with a billable diagnostic code indicating drug exposure

ADHS Arizona Hospital Discharge Data 2014

Arizona Data: 2008 – 2014 Substance Exposed Infants

- From 2008-2014:
 - Newborns with narcotics in their system rose **235%**
 - Babies born with fetal alcohol syndrome increased **50%**
 - The number of infants hospitalized after birth due to maternal drug use in pregnancy increased 74.3 % between 2009 and 2015

ADHS- Arizona Hospital Discharge Data 2014
ADHS 2015 Population Health and Vital Statistics

Arizona Data: 2008 – 2014 Substance Exposed Infants

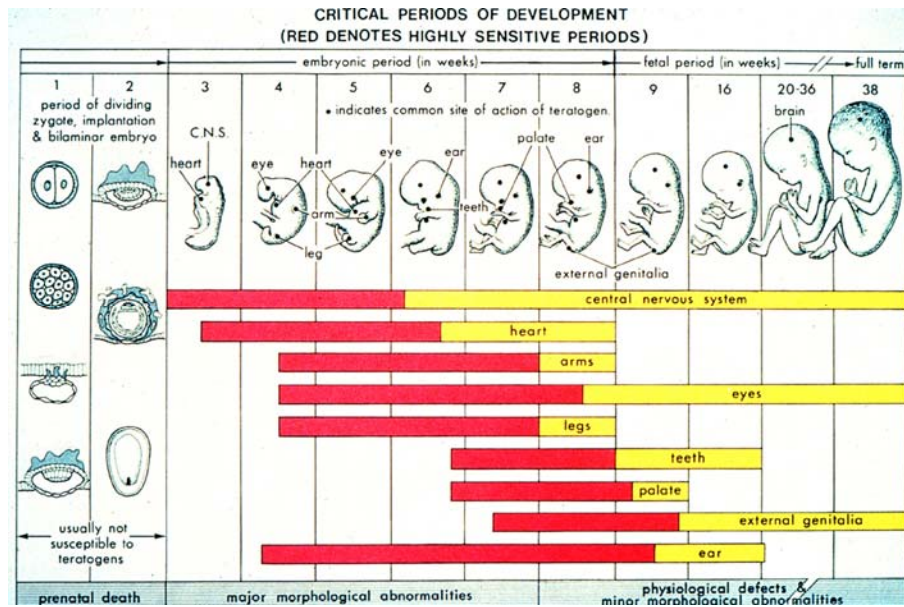
- Arizona's rates of prenatal exposure are significantly under-reported
 - Lack of uniform medical coding
 - Lack of provider education, re: early identification of substance-exposed newborn (SEN)

ADHS - Arizona Hospital Discharge Data 2014

Substance Exposed Infants

- Longer and much more costly hospital course
 - Costs continue on into infancy & childhood due to effects on
 - Growth
 - Behavior
 - Cognition/Executive functioning
 - Language
 - Achievement in school

Fetal Development Timeline



Observed Effects of Substance Abuse in the Newborn

	<u>Nicotine</u>	<u>Alcohol</u>	<u>Marijuana</u>	<u>Cocaine</u>	<u>Opioids</u>	<u>PCP</u>	<u>Meth</u>	<u>Benzos</u>
<u>Prematurity</u>	Yes	Yes	No	Yes	Yes/No	No	Yes/No	Yes
<u>Low Birth Weight</u>	Yes	Yes	No	Yes	Yes/No	No	Yes	Yes
<u>Neuro - Behavioral SX</u>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<u>NAS</u>	Yes	Yes	No	No?	Yes	Yes/No	Yes?	Yes
<u>Congenital Malformations</u>	Yes/No	Yes	No?	Yes/No	No	Yes	Yes?	Yes/No
<u>SIDS</u>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
<u>Child Abuse or Neglect</u>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Yes/No = both have been reported, ? = controversial or unclear findings

Adapted from Jansson LM, Velez ML. Peds in Review. Jan 2011

Prenatal Drug exposure- Summary of Effects

	Nicotine	Alcohol	Marijuana	Opiates	Cocaine	Methamphetamine
Short-term effects/birth outcome						
Fetal growth	Effect	Strong effect	No effect	Effect	Effect	Effect
Anomalies	No consensus on effect	Strong effect	No effect	No effect	No effect	No effect
Withdrawal	No effect	No effect	No effect	Strong effect	No effect	*
Neurobehavior	Effect	Effect	Effect	Effect	Effect	Effect
Long-term effects						
Growth	No consensus on effect	Strong effect	No effect	No effect	No consensus on effect	*
Behavior	Effect	Strong effect	Effect	Effect	Effect	*
Cognition	Effect	Strong effect	Effect	No consensus on effect	Effect	*
Language	Effect	Effect	No effect	*	Effect	*
Achievement	Effect	Strong effect	Effect	*	No consensus on effect	*

* Limited or no data available.

Pediatrics 2013;131:e1009–e1024

A.R.S. § 8-201.24(c) & (d)

Statute on Neglect as it pertains to a Substance Exposed Newborn

- A determination by a health professional that a newborn infant was exposed prenatally to a drug or substance that was not the result of a medical treatment
- Based on one or more of the following:
 - Clinical indicators in the prenatal period including maternal and newborn presentation
 - History of substance use or abuse
 - Medical history
 - Results of a toxicology or other laboratory test on the mother or the newborn infant
- Diagnosis by a health professional of an infant under one year of age with clinical findings consistent with fetal alcohol syndrome or fetal alcohol effects

The Substance Exposed Newborn (SEN)

- DCS can only become involved after the child is born.

The Substance Exposed Newborn (SEN)

- SEN ≠ NAS
- Not all substance exposed Newborns will have Neonatal Abstinence syndrome
- SEN also includes infants who are exposed to medication that may have been prescribed- not just illicit use.

Neonatal Abstinence Syndrome (NAS) Neonatal Opioid Withdrawal Syndrome (NOWS)

- NAS refers to the constellation of problems that occur when a newborn who was exposed to drugs while in utero
- Is when a newborn baby has signs of withdrawal
- Clinical signs would escalate over time as the drug is metabolized and eliminated from the body

Neonatal Abstinence Syndrome (NAS)

Typically NAS occurs when the baby has been exposed in utero to certain drugs

Prescription Medications

- Oxycodone
- Codeine, Hydrocodone (Vicodin)
- Synthetic opioids (Dilaudid)
- Methadone
- Oxycodone (Oxycontin, Percocet)
- Methadone
- Buprenorphine
- Fentanyl
- Ativan
- Xanax
- Antidepressants
- Selective serotonin reuptake inhibitors (SSRIs) (Prozac, Paxil, Zoloft)
- Benzodiazepines
- Illicit Drugs (Heroin)

Neonatal Abstinence Syndrome (NAS) Neonatal Opioid Withdrawal Syndrome (NOWS)

- True NAS or non-specific neurobehavioral & regulatory impairment?
 - Seen to some extent with all substances of abuse
- Neonatal abstinence syndrome includes a combination of physiologic and neurobehavioral signs that include
- Most NAS will be treated with comfort measures and **not medications**

Neonatal Abstinence Syndrome (NAS) Neonatal Opioid Withdrawal Syndrome (NOWS)

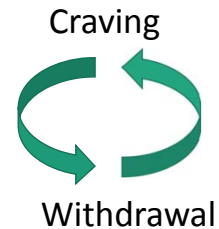
- Nervous system problems
 - Hyper-irritability, tremors, twitches, increased reflexes, frantic suck
 - Persistent crying, difficulty being consoled, difficulty sleeping
 - Increased muscle tone, increased startle reflex, increased movement
- Intestinal disturbances
 - Feeding problems, vomiting or diarrhea
- Respiratory problems
 - Irregular breathing or apnea (breathing stops)
- Autonomic dysfunction (unconscious body functions)
 - Yawning, sneezing, sweating, mottling, temperature variations, runny nose, watery eyes, fast heart rate
- Infants with neonatal abstinence syndrome can require prolonged hospitalization and require treatment with medication

Neonatal Abstinence Syndrome (NAS) Neonatal opioid Withdrawal Syndrome (NOWS)

- In 2014, 438 babies were born with NAS
- A 235% increase since 2008

Opioid Use Disorder (OUD) Substance Use Disorder (SUD)

- Narcotics & pain killers
 - Prescription medications
 - hydrocodone/Vicodin, oxycodone/OxyContin, Percocet, morphine, codeine
 - Heroin & Methadone
- Brain receptors altered = Chronic Brain Disease
 - Cycle of drug craving and drug withdrawal
- Methadone/Buprenorphine Therapy
 - Provides safer drug substitute
 - Long half-life - eliminates craving and breaks cycle
 - Goal is rehabilitation
- Do not detox during pregnancy
 - Preterm labor or pregnancy loss



Opioid Use Disorder (OUD)- prenatal exposure

- During pregnancy, chronic untreated heroin use is associated with an increased risk of
 - fetal growth restriction
 - abruptio placentae
 - fetal death
 - preterm labor and
 - intrauterine passage of meconium
- These effects may be related to the repeated exposure of the fetus to opioid withdrawal as well as the effects of withdrawal on placental function

Opioids Use Disorder (OUD)- prenatal exposure

- An association between first-trimester use of codeine and congenital heart defects has been found in three of four case-control studies
- The observed birth defects remain rare with a minute increase in absolute risk.
- Although none of these studies investigated methadone or buprenorphine specifically, concern about a potential small increased risk of birth defects associated with opioid-assisted therapy during pregnancy must be weighed against the clear risks associated with the ongoing use of illicit opioids by a pregnant woman.

Opioids Use Disorder (OUD)- prenatal exposure

- The lifestyle issues associated with illicit drug use put the pregnant woman at risk of engaging in activities, such as
 - prostitution
 - theft and
 - violenceto support herself or her addiction.
- Such activities expose women
 - to sexually transmitted infections
 - becoming victims of violence and
 - legal consequences
 - including loss of child custody
 - criminal proceedings or
 - incarceration

Opioid Use Disorder (OUD) – Treatment

- Any treatment modality has to address both the physiologic as well as the psychologic aspects of addiction
- These programs should include
 - Counseling
 - Cognitive and behavioral therapy
 - Pharmacologic therapy if indicated- Medication Assisted Treatment (MAT)

Opioid Use Disorder (OUD) Treatment - Medication Assisted Treatment (MAT)

- Heroin/pain medications
- Opioid use in pregnancy is not uncommon
- The use of illicit opioids during pregnancy is associated with an increased risk of adverse outcomes

Opioid Use Disorder (OUD) Treatment - Medication Assisted Treatment(MAT) in Pregnancy

- American College of Obstetrics and Gynecology issued a statement in March 2016
 - During the intrapartum and postpartum period, special considerations are needed for women who are opioid dependent to
 - ensure appropriate pain management
 - to prevent postpartum relapse and a risk of overdose
 - to ensure adequate contraception to prevent unintended pregnancies.

Opioid Abuse, Dependence and Addiction in Pregnancy: A Joint Opinion of the American College of Obstetricians and Gynecologists' Committee on Health Care for Underserved Women and the American Society of Addiction Medicine Adoption Date: May 2012

Opioid Use Disorder (OUD) Treatment - Medication Assisted Treatment(MAT) in Pregnancy

- American College of Obstetrics and Gynecology statement March 2016
 - To assure optimal health outcomes for both a woman and her baby, it is recommended that patients and providers continue opioid agonist treatment in pregnancy .

Opioid Abuse, Dependence and Addiction in Pregnancy: A Joint Opinion of the American College of Obstetricians and Gynecologists' Committee on Health Care for Underserved Women and the American Society of Addiction Medicine Adoption Date: May 2012

Opioid Use Disorder (OUD) Treatment - Medication Assisted Treatment(MAT) in Pregnancy

- American College of Obstetrics and Gynecology statement March 2016
 - While some studies have suggested an association between birth defects and other adverse outcomes with opioid use in pregnancy, the absolute risk of these problems is low and data demonstrating a causal connection are lacking.
 - As a result, there are circumstances in which the balance of risk and benefits argues for judicious use of these medications in pregnancy, either for pain management or opioid agonist treatment.

Opioid Abuse, Dependence and Addiction in Pregnancy: A Joint Opinion of the American College of Obstetricians and Gynecologists' Committee on Health Care for Underserved Women and the American Society of Addiction Medicine Adoption Date: May 2012

Opioid Use Disorder (OUD) Treatment - Medication Assisted Treatment(MAT) in Pregnancy

- American College of Obstetrics and Gynecology statement March 2016
 - Neonatal abstinence syndrome is the most established risk to newborns from use of opioids in pregnancy, but it is expected and treatable, and does not appear to pose permanent risks to the neonate.

Opioid Abuse, Dependence and Addiction in Pregnancy: A Joint Opinion of the American College of Obstetricians and Gynecologists' Committee on Health Care for Underserved Women and the American Society of Addiction Medicine Adoption Date: May 2012

Opioid Use Disorder (OUD) Treatment - Medication Assisted Treatment(MAT) in Pregnancy

- American College of Obstetrics and Gynecology statement March 2016
 - However, evidence shows that withdrawal from opioid use during pregnancy may be associated with complications including fetal demise.

Opioid Abuse, Dependence and Addiction in Pregnancy: A Joint Opinion of the American College of Obstetricians and Gynecologists' Committee on Health Care for Underserved Women and the American Society of Addiction Medicine Adoption Date: May 2012

Opioid Use Disorder (OUD) Treatment - Medication Assisted Treatment(MAT) in Pregnancy

- American College of Obstetrics and Gynecology statement March 2016
 - The rationale for opioid-assisted therapy during pregnancy
 - prevent complications of illicit opioid use and narcotic withdrawal
 - encourage prenatal care and drug treatment
 - reduce criminal activity and
 - avoid risks to the patient of associating with a drug culture
 - Comprehensive opioid-assisted therapy that includes prenatal care reduces the risk of obstetric complications

Opioid Abuse, Dependence and Addiction in Pregnancy: A Joint Opinion of the American College of Obstetricians and Gynecologists' Committee on Health Care for Underserved Women and the American Society of Addiction Medicine Adoption Date: May 2012

Opioid Use Disorder (OUD) Treatment - Medication Assisted Treatment (MAT)

- American College of Obstetrics and Gynecology statement March 2016
 - Methadone maintenance, as prescribed and dispensed on a daily basis by a registered substance abuse treatment program is part of a comprehensive package of
 - prenatal care
 - chemical dependency counseling
 - family therapy
 - nutritional education and
 - other medical and psychosocial services as indicated for pregnant women with opioid dependence

Opioid Abuse, Dependence and Addiction in Pregnancy: A Joint Opinion of the American College of Obstetricians and Gynecologists' Committee on Health Care for Underserved Women and the American Society of Addiction Medicine Adoption Date: May 2012

Opioid Use Disorder Treatment & Neonatal Abstinence Syndrome (NAS) Neonatal Opioid Withdrawal Syndrome (NOWS)

- Methadone exposure has been associated with more severe withdrawal than has exposure to heroin
- Early reports regarding buprenorphine, a more recent alternative to methadone, suggest minimal to mild withdrawal in exposed infants.
- Currently there is limited data on the use of buprenorphine in pregnancy and the effects on the fetus, but this body of information is growing.

Opioid Use Disorder Treatment & Neonatal Abstinence Syndrome (NAS) Neonatal Opioid Withdrawal Syndrome (NOWS)

- Prevention

- Prevent women of child bearing age from using opioids- alternative medications for pain
- Prevent women on opioids becoming pregnant- reproductive health counseling and resources
- Prevent pregnant women who are already on opioids from having infants with NAS/NOWS (no research/information on this as of yet)

Opioid Use Disorder Treatment & Neonatal Abstinence Syndrome (NAS) Neonatal Opioid Withdrawal Syndrome (NOWS)

- Treatment of the Mother

- MAT

- Treatment of the Neonate with NAS/NOWS

- The primary goal is to promote normal growth and development an to avert or minimize negative outcomes including discomfort and seizures in the infant and impaired maternal bonding.

McQueen, K.(2016). Neonatal Abstinence Syndrome, N Engl J Med 2016; 375:2468-2479 .
DOI 10.1056/NEJMra1600879

Opioid Use Disorder Treatment & Neonatal Abstinence Syndrome (NAS) Neonatal Opioid Withdrawal Syndrome (NOWS)

- Treatment of the Neonate with NAS/NOWS
 - Supportive Care- creating a gentle soothing environment with minimal stimulation in an effort to calm and soothe the baby
 - Current standard of care involves
 - Limiting exposure to lights and noise
 - Clustering care to minimize handling and promote rest
 - Swaddling and holding the infant
 - Providing opportunities for non nutritive sucking
 - Additional supportive interventions – music therapy , massage, recruitment of volunteers to cuddle the infant when mom is not available
 - Breast feeding (unless there are contraindications)
 - Rooming in (if possible)

McQueen, K.(2016). Neonatal Abstinence Syndrome, N Engl J Med 2016; 375:2468-2479 .
DOI 10.1056/NEJMra1600879

Opioid Use Disorder Treatment & Neonatal Abstinence Syndrome (NAS) Neonatal Opioid Withdrawal Syndrome (NOWS)

- Treatment of the Neonate with NAS/NOWS
 - Treatment of any other medical issues the baby has, e.g.
 - Low birth weight – follow feeding and weight gain
 - Seizures- occur in less than 1-3% of heroin exposed babies
 - Making sure there are no other medical conditions that are mimicking NAS
 - Pharmacologic treatment
 - The main objective of pharmacologic treatment is to relieve moderate-to-severe signs such as seizures, fever, and weight loss or dehydration
 - Despite the importance of pharmacologic treatment, there is no universally accepted standard of care, and variations exist in the use of doses based on weight or symptoms, as well as the threshold for initiating treatment, starting doses, weaning protocols, and adjunctive medications
 - There is current consensus in practice that first-line pharmacotherapy consists of opioid replacement with either oral morphine solution or methadone. Oral morphine is the most common treatment in the United States
 - Most NAS will be treated with **comfort measures** and **not medications**

McQueen, K.(2016). Neonatal Abstinence Syndrome, N Engl J Med 2016; 375:2468-2479 .
DOI 10.1056/NEJMra1600879

Opioid Use Disorder (OUD)- Challenges

- Research on both NAS and NOWS is confounded by polysubstance exposure and maternal comorbidity.
- MAT capacity is inadequate
- Pregnant women are identified as a priority population
 - If programs are unavailable- this designation does not help
- Perception that regulation of MAT is burdensome
- Persistent lack of acceptance of Substance Use Disorder (SUD) as a chronic brain disease despite abundant supporting research and extensive public education
- Rejection of the evidence for MAT by abstinence-based programs results in the exclusion of persons receiving MAT from social and behavioral services available to others through these programs.

SAMHSA- Protecting Our Infants Act: Final Strategy

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SAMHSA- Protecting Our Infants Act: Final Strategy

Opioid Use Disorder (OUD)- Challenges

- Prejudice remains perhaps the greatest barrier to the adoption and dissemination of effective, evidence-based interventions,
- Compartmentalization of data, knowledge, and skills across levels of government, service providers, and professional disciplines follows as the next greatest barrier.

SAMHSA- Protecting Our Infants Act: Final Strategy

Breast Feeding- Opiates

- For women in well-supervised methadone-maintenance programs for treatment of opioid dependence
 - breastfeeding is encouraged and may be important to avoid neonatal abstinence syndrome

Methadone & Breast Feeding

- Concentrations of methadone in breast milk were low
- Concentrations of methadone in infant plasma were low
- No significant effects on neurobehavioral outcomes
- Lower incidence of NAS
- Fewer infants required medications for NAS
- Require shorter pharmacotherapy for NAS
- Increased maternal confidence
- Enhanced mother-infant bonding
- Improvement of familial social functioning through stress reduction

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Factors to consider

- Drugs used
- Medical Complications
- Postnatal Caregiving Environment
- Parental Resilience
- Social Connections
- Concrete Support

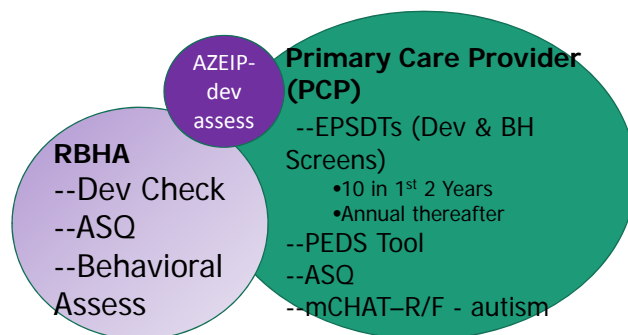
Factors to consider

- Currently the only medication assisted treatment plan is for opioid addiction is Methadone
- Buprenorphine (Subutex) (not studied in pregnancy)
- Buprenorphine/Naloxone (Suboxone). Naloxone (not studied in pregnancy)
 - Can precipitate withdrawal in the fetus
- Reduce problem addiction behavior
- Can take MAT as long as needed
 - Not uncommon for this to be lifelong treatment
 - Dose is not relevant
 - Taper will likely lead to relapse
 - Can safely parent & drive while on MAT
 - Assuming compliance with program requirements
 - Check with Addiction Specialist managing the parent

Care of the SEN baby- who has left the hospital

- Similar to other children with emphasis on Developmental follow up
- Early frequent visits as signs of
- Establish Primary Care Pediatrician (PCP) & Medical Home
 - 10 EPSDTs (well child visits) in 1st 2 years of life
 - Developmental & Behavioral Health Screening
 - At least annual EPSDT after age 2
 - Use of developmental screening tool
- Establish a Dental Home
 - No referrals needed for dental care
 - Dental care begins at age one (1)!!
 - Routine preventative visits twice/year
- Ensure RBHA (behavioral health) services ASAP
 - Rapid Response within 72 hours of placement- which include the use of a developmental screening tool
 - Assessment starts 7 days after the rapid response and involves the Birth to Five assessment
 - Do NOT take “wait and see” attitude
 - RBHAs must keep children in out of home care open for services for a minimum of 6 months

Birth – Five Assessments Developmental & Behavioral Screening



Summary

- Substance abuse is a large reason for the entry of children into DCS care
- We are in the middle of a opiate epidemic
- MAT – needs to be evaluated carefully and in the context of the family and the MAT program.
- DO NO HARM

Specialized Care and Services

- Division for Developmental Disabilities (DDD)
- DDD/ALTCS (Az Long Term Care Services)
- AZ Early Intervention Program (AzEIP)
- Behavioral Health (RBHAs)
- Children's Rehabilitative Services (CRS)

Light at End of the Tunnel?

1. GAO Report – February 2015. PRENATAL DRUG USE AND NEWBORN HEALTH Federal Efforts Need Better Planning and Coordination: <http://gao.gov/assets/670/668385.pdf>
2. Protecting Our Infants Act of 2015 legislation S.799 <https://www.congress.gov/bill/114th-congress/senate-bill/799/text> and March of Dimes Fact Sheet <http://www.marchofdimes.org/materials/Protecting-Our-Infants-Act-Fact-Sheet-March2015.pdf>
3. Arizona Opioid Prescribing Guidelines <http://azcjc.gov/ACJC.Web/Rx/opioid-prescribing-guidelines.pdf>
4. SB 1032 - AHCCCS; contractors; prescription monitoring. AHCCCS contractors shall intervene when a member has 10 or more prescriptions for a controlled substance within a 3 month period <http://www.azleg.gov/legtext/52leg/1r/bills/sb1032s.htm>
5. SB1370 controlled substances prescription monitoring program. Requires physicians register with the Controlled Substance Monitoring Program (CSPMP) <https://legiscan.com/AZ/text/SB1370/id/1200769/Arizona-2015-SB1370-Chaptered.html>

Helpful References

- Special Care for the Substance-Exposed Newborn - brochure for caregivers <https://dcs.az.gov/sites/default/files/CSO-1072A.pdf>

- MothersToBaby.org



Arizona Department of Child Safety