

## Optimizing Care of the Infant with Neonatal Abstinence Syndrome

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### Disclosures

- I am an employee of Prolacta Bioscience as a Medical Science Liaison, Neonatal and Pediatric Nursing
- I am an employee of Kalispell Regional Healthcare where I have been since 1982
- Co-founder of Aspir, LLC
- All product photos are for educational purposes only and do not indicate support or promotion of any product



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### Objectives

- Understand the Eat/Sleep/Console (E/S/C) model of care for infants with Neonatal Abstinence Syndrome
- Discuss the E/S/C model's impact on length of stay and outcomes for infants exhibiting withdrawal symptoms
- Discuss clinical interventions for the care of the infant with Neonatal Abstinence Syndrome

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## Background

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## Opiate Use on the Rise

- Legitimate pain medication
- Medication assisted treatment: methadone and buprenorphine
- Illicitly obtained narcotics
- Combinations
  - Narcotics cut with other substances to make them more addictive
- Polysubstance abuse



Over 67% of pregnant women have a current opioid prescription.

SOURCE: Turner, SD. Neonatal opioid withdrawal and antenatal opioid prescribing. CMAJ Open. 3(1): E55-61. Epub. 2015 Feb 11.

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## Risks of Maternal Opiate Use

- Increased maternal mortality including overdose
- Intrauterine growth restriction
- Premature birth
- Stillbirth
- Sudden Infant Death Syndrome (SIDS)
- Neonatal Abstinence Syndrome (NAS)
- Increased cost to healthcare systems
- Increased use of child and family services (foster care system)
- Future behavior and learning problems
- Increased risk of visual and hearing impairment

SOURCE: March of Dimes. <https://www.marchofdimes.org/complications/neonatal-abstinence-syndrome-nas.aspx>.

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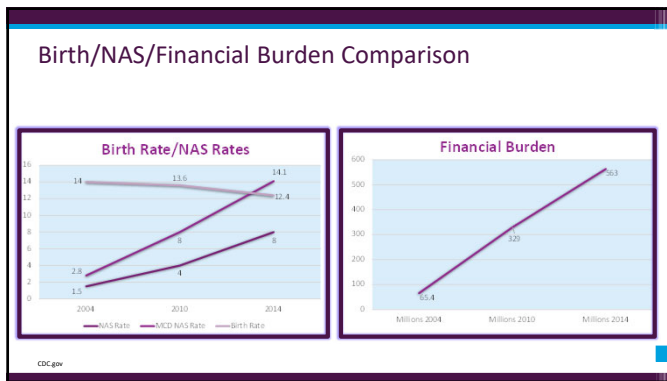
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### Neonatal Abstinence Syndrome

What it is.  
What it isn't.  
What can we do about it?

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### Infants Are Not Born Addicted

- Addiction is behavioral
- Babies can be physically dependent
  - Intrauterine exposure
  - Iatrogenic dependence

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## Physiology

- Once the umbilical cord is cut, the supply is stopped and the receptors in the brain must adapt to the absence of those substances
- When those receptors in the brain are not filled, physical symptoms of withdrawal begin: sweats, shakes, GI disturbances, inconsolable crying
- This can lead to poor adaptation, inadequate nutrition, dehydration, along with parent and staff frustration

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## Predicting Which Babies Will Have NAS is Difficult

- An estimated 55-94% of babies exposed to opioids in utero will develop signs of NAS
- No clear correlation between dose of maternal opioid and severity of withdrawal
- Clinical presentation and course of NAS depends on many factors
  - Opioid of choice
  - Maternal drug history
  - Maternal and infant metabolism
  - Placental metabolism
  - Exposure to other substances
  - Parent participation in care

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## Goals of NAS Management

- Withdraw safely
  - Prevent morbidities (seizures)
  - Minimize morphine
    - Morphine acts on multiple developing neurologic pathways
    - May inhibit normal synaptic development and pruning
    - Influences cellular apoptosis
- Eat and grow (do what babies do)
- Improve family care and interaction
  - Maintain family unit when able
  - Decrease risks of abuse
- Limit length of hospitalization (\$, risks)



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## NAS Assessment

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## First: Don't Miss Something...

- Don't be lulled into complacency by parent appearance ("she doesn't look like a user")
- Don't miss something because of parent appearance/behavior (assumptions)
- Many newborn conditions have symptoms that might be misconstrued as withdrawal:
  - Hypoglycemia
  - Hypocalcemia
  - Hyperthyroidism
  - Intracranial Hemorrhage
  - Sepsis
  - Encephalopathy
  - Metabolic disorder
  - Congenital Heart Disease

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## Scoring Tools

- The Modified Finnegan Scoring Tool is the most widely used
  - Developed in 1975 in a single unit
  - Has served the purpose well for 45 years
  - Has never been validated (nor has any other tool)
  - Care is dictated by a number – which some people appreciate
  - Time consuming
  - Problems with inter-rater reliability
- The tool is not wrong
- What we have been doing has not been wrong

SOURCE: Finnegan, LP. The assessment and management of Neonatal Abstinence Syndrome. Primary Care, 3<sup>rd</sup> ed. 1992.

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## But is it Time for a Different Approach?

- Should we be assigning scores and potentially medicating for things that we see in babies that have never been exposed to opiates?
  - Sneezing
  - Cluster feeding
  - Yawning
  - Spitting up
  - Mottling
  - Crying for >15 seconds

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## Eat/Sleep/Console (ESC) Model of Care

- Plan:
  - Maximize non-pharmacological treatments
  - Maximize parent/caregiver involvement
- Goal:
  - Baby does what babies need to do
    - Eats
    - Sleeps
    - Is consolable



SOURCE: Grisham, L. Eat, sleep, console approach: A family centered model for the treatment of neonatal abstinence syndrome. *Advances in Neonatal Care*. April 2019. Vol 19, Issue 2.

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## Can the Baby Eat?

- Adequate feeding depends on the gestational age and postnatal age of the infant
- Poor feeding (a “No” answer)
  - Baby is unable to coordinate feeding within 10 minutes of showing hunger cues
  - Unable to remain at breast for at least 10 minutes once latch is attained
  - Unable to take at least 15-30 mls from a bottle

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### Can The Baby Eat? (cont.)

- Do not indicate "No" if poor eating is due to factors other than NAS
  - Prematurity
  - Transitional sleepiness or spittiness in the first 24 hours of life
  - Inability to latch due to infant/maternal anatomical factors
- If unclear if inability to eat is due to NAS, indicate "No" and continue to monitor

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### Can the Baby Sleep?

- Can the infant sleep for at least one hour after feeding?
  - This includes baby being in a quiet awake state
  - Even if he or she will only sleep if being held
- "No" indicates the baby is unable to sleep for at least one hour after feeding due to opioid withdrawal (fussiness, increased startle, tremors, restlessness)
- Do not indicate "No" if sleeping <1 hour is non-opioid related
  - Nicotine or SSRI withdrawal
  - Cluster feeding in the first few days of life
  - Interruptions for routine testing (shouldn't be happening)

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### Is the Baby Consolable?

- A "No" answer (inconsolable) indicates the infant is unable to be consoled within 10 minutes despite maximum non-pharmacological interventions:
  - Using soft voice to calm infant
  - Facilitating gently bringing hands to mouth
  - Placing hands firmly/gently on infant's abdomen
  - Bringing infant's arms and legs to midline (containing)
  - Picking up, holding skin-to-skin, swaddling, rocking, swaying
  - Offering a feeding or non-nutritive sucking

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## Is the Baby Consolable? (cont.)



- Do not indicate "No" if the infant's inconsolability is due to non-opioid related factors
  - Caregiver non-responsiveness to cues
  - Hunger
  - Circumcision (or other) pain

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EAT/SLEEP/CONSOLE (ESC) CARE TOOL											
<b>Caring</b>											
Greatest feeds >10 min or nipples > 15-30 min	Yes/No										
<b>Sleeping</b>											
Crying > 3 hour	Yes/No										
<b>Consoling</b>											
Ables to console within 10 minutes	Yes/No										
<b>Consoling support needed</b>											
1. Able to console on own											
2. Able to console with caregiver support within 10 minutes											
3. Unable to console despite caregiver support within 10 minutes											
<b>Plan of Care</b>											
Recommend formal parent/caregiver hold	Yes/No										
Recommend full care team hold	Yes/No										
<b>Management decision</b>											
1. Continue/optimise non-pharm care											
2. Initiate medication treatment											
3. Continue medication treatment											
4. Begin/continue medication weaning											
<b>Parent/caregiver presence</b>											
1. No parent present											
2. < 1 hour											
3. 1-2 hours											
4. 2-3 hours											
5. > 3 hours											
<b>Non-pharmacologic interventions (non-medication)</b>											
Rooming-in											
Parent presence											
Skin-to-skin contact											
Holding by caregiver or other											
Optimal feeding with longer cues											
Non-nutritive suck											
Quiet, dim environment											
Limiting number of visitors											

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## Individualize Care

- No single regimen is going to work for every baby
- Provide care and perform scoring *based on infant's waking & feeding schedule*
- Skin-to-skin & feed *before* scoring
- Skin-to-skin / hold *during* scoring
- Conduct exam slowly, maintaining good containment of arms and legs

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## Non-Pharmacologic Interventions

- Parents/caregivers are the first line of treatment
  - Rooming in – where to house them
    - Evaluate safety: Is there active drug use? Are they a flight risk?
    - We keep parents in a postpartum room with their baby even after mom is discharged
    - Mother/baby nurse is responsible for the infant
    - If father is sole caregiver, we use a NICU or peds room
  - If medication is required, baby is transferred to the NICU with caregiver
  - Encourage an alternate for the primary care giver – these babies are exhausting

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## Non-Pharmacologic Interventions (cont.)



- Kangaroo care (skin-to-skin)
- Encourage breastfeeding
  - If mom is in a supervised program
  - If not in a program and says she isn't using, we do random observed urine drug screens
- Quiet, dim environment - decrease stimulation
- Aromatherapy – mom's scent, lavender, chamomile
- "Cuddlers"

SOURCES: <https://www.chh.ca/sites/default/files/document/opioid-related-harms-report-2018-en-esch.pdf>; Grossman, MR. An initiative to improve the quality of care of infants with neonatal abstinence syndrome. Pediatrics, June 2017, 139 (6) e20163360; DOI <https://doi.org/10.1542/peds.2016-3360>; Daniel, JM. Aromatherapy as an adjunctive therapy for neonatal abstinence syndrome: A pilot study. Journal of Opioid Management, Vol 16, No 2, 2020.

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## Non-Pharmacologic Interventions (cont.)

- Swaddling
- Horizontal holding, tummy to tummy (C-hold)
- Rocking or swinging
- Repetitive soft noise such as shushing or soft music
- Sucking - the urge is almost insatiable for some
  - Pacifier
  - Pacifier activated lullaby system



Photo is for informational purposes only

SOURCES: <https://www.chh.ca/sites/default/files/document/opioid-related-harms-report-2018-en-esch.pdf>; Grossman, MR. An initiative to improve the quality of care of infants with neonatal abstinence syndrome. Pediatrics, June 2017, 139 (6) e20163360; DOI <https://doi.org/10.1542/peds.2016-3360>; Daniel, JM. Aromatherapy as an adjunctive therapy for neonatal abstinence syndrome: A pilot study. Journal of Opioid Management, Vol 16, No 2, 2020.

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## What if the answer to Eat, Sleep, or Console is No?

- If the answer to any of those questions is no:
  - Team discussion (including parents) regarding treatment options
  - Optimize non-pharmacological interventions
- If still unable to meet the E/S/C goals:
  - A PRN dose of morphine can be tried
  - If still not meeting goals, initiate pharmacotherapy regimen
- Continue to maximize all non-pharmacologic interventions

SOURCE: Alexander, C. Donor human milk may decrease severe gastrointestinal distress in infants with neonatal abstinence syndrome. *Journal of Pregnancy and Neonatal Medicine* (2017) Volume 1, Issue 1.

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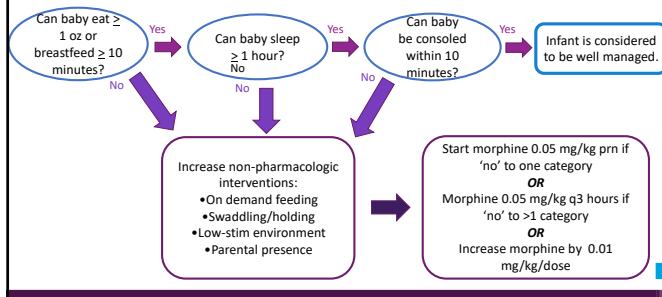
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## Eat/Sleep/Console Approach to NAS



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## Incentivized Parenting

- Socially disparate referral base
- Wanted more parent involvement – especially from those with OUD
- Immediate, tangible rewards have been shown to work the best
  - Not money, not gift cards
  - No budget to work with
- What activities did we want to see
  - Increased pumping
  - Time at bedside
  - Homework
- Partnerships with community resources
  - Pregnancy center
  - Family services

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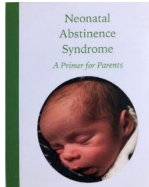
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## Teach Mom to be a Mom

- Be kind, be compassionate, use non-judgmental language (including body language)
- Teach mom to read her baby's cues, she may have zero experience with infants
  - How to respond to infant's physical needs
  - How to provide developmentally appropriate care
  - Provide written information/education
- Teach her the scoring system you are using
  - Explain why you score what you do
  - Acknowledge and encourage her input



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## Think of Parents As Treatment

- Parents should provide hands on care with support, education, and supervision but not micromanagement
- If admission to the NICU is needed, it should be a smooth transition without changes in parent expectations or involvement
- Even if it is likely this baby will be removed, parents should parent

SOURCE: McMullen, NJ. Evidence-based interventions for neonatal abstinence syndrome. Pediatric Nursing, July-Aug/Vol. 40/No 4.

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## Benefits

### Grossman et al 2018

- N=287 opioid exposed infants
- Standardized non-pharm treatment
- Parental involvement
- ESC assessment
- Morphine PRN
- Results
  - ALOS decreased from 22.4 to 5.9 days
  - Morphine treatment decreased from 98% to 14%
  - Costs decreased from \$44,824 to \$10,289/patient

### Wachman et al 2018

- N=240 opioid exposed infants
- Non-pharm care bundle
- Function based assessment (early version of ESC)
- Methadone for pharm intervention
- Results
  - ALOS decreased from 17.4 to 11.6 days
  - Pharm treatment decreased from 87.1% to 40%
  - Adjunctive agent use decreased from 33.6% to 2.4%

SOURCE: Grisham, L. Eat, sleep, console approach: A family centered model for the treatment of neonatal abstinence syndrome. Advances in Neonatal Care, April 2019, Vol 19, Issue 2.

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## Benefits

### Grossman et al 2018

- N=50, retrospective chart review
- Treated using ESC model
- FNASS was done simultaneously but did not affect pharm treatment
- Results:
  - 12% of infants received pharm treatment using ESC model of care
  - If care had been based on FNASS 62% would have been treated

### Our Results

- ALOS decreased from 31 days to 13.3 days
- >40% reduction in the number of infants requiring pharmacological treatment (no decrease in number of exposed infants)
- Decrease in direct foster care placement from ~80% to 10%

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## Care Beyond Scoring and Medication

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## Nutrition

- Growth goals
  - <10% weight loss
  - Should be back to birthweight by 2 weeks
- Many of these infants will have issues with nutrition and growth
  - High metabolic demands
  - Hypermotility with poor absorption
  - Regurgitation and vomiting
- Fortification should be started early
  - All milk not directly from the breast should be fortified to meet the increased metabolic demands until volume is sufficient to support growth
  - Volumes may seem exorbitant, but demands require it

SOURCE: MMullen, NJ. Evidence-based interventions for neonatal abstinence syndrome. Pediatric Nursing. July-Aug/Vol. 40/No. 4.

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## The Role of Human Milk

- **Human babies are made to digest human milk**
- Superior nutrient absorption, superior digestion (Institute of Medicine)
  - Poor absorption is common in the infant experiencing NAS
- Human milk has components that have been shown to improve neurodevelopmental outcomes and visual acuity
  - Both systems are at risk in the prenatally exposed infant
- Human milk is known to support the newborn immune system
  - Especially important for the hospitalized newborn

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## GI Disturbances are Significant Contributors to NAS Scores

- Alexander, et al studied the impact of a human milk diet on infants requiring pharmacologic treatment for NAS symptoms
  - Infants were fed all (donor) human milk or all cow's milk-based formula
  - All other treatments were according to established protocols
- The proportion of infants with GI sub-scores greater than 2 was significantly higher in the formula group ( $p=0.001$ )
  - Suggests human milk has some capacity to calm the GI tract during acute withdrawal period
  - GI sub-scores can account for up to 6 points on the FST
  - May have even higher impact if irritability is due to GI distress

SOURCE: Alexander, C. Donor human milk may decrease severe gastrointestinal distress in infants with neonatal abstinence syndrome. *Journal of Pregnancy and Neonatal Medicine* (2017) Volume 1, Issue 1.

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## Feeding

- Feed frequently
  - Ad lib, on demand (actually before demanding)
  - Have feeding (mom) ready and waiting
  - Feed right away when infant stirs
  - Don't do your exam, temperature, diaper change first -by then things are way out of control
- Try different nipples - may need something with a wide base
- May require an NG tube if intake is insufficient



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## Skin Care

- Start diaper area barrier protection on day 1
  - Any infant experiencing NAS will likely have loose stools
  - Increased motility causes stools to be very acidic
- Leave open to air if possible (risky)
- Tub soaks at least daily
- Oxygen is often used, but there is no evidence to support this practice



SOURCE: McMullen, NJ. Evidence-based interventions for neonatal abstinence syndrome. Pediatric Nursing. July-Aug/Vol. 40/No 4.

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## Involve Other Team Members

- Social worker - involvement is paramount
  - Resources for families
  - Needs to have the same non-judgmental approach
  - Sometimes met with resistance (social worker = removal)
- Lactation specialist
  - Knowledgeable regarding medications in mom's milk
  - Determine if feeding difficulties might be related to reasons other than NAS
- Physical therapist
  - Teach/facilitate therapeutic touch and infant massage
  - Help mom learn developmental positioning

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## Barriers to this Model of Care

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### Requires a Change in Attitude and Approach

- Involvement of parents as primary care givers rather than excluding them
- Compassion regardless of personal feelings
  - Many will be coming from a background of abuse with very high ACE scores (adverse childhood experiences)
  - Most of these moms expect to be treated poorly based on past experiences with the healthcare system
  - Many have never been parented so they don't even know what that should look like

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### Time and Attention Intensive

- These infants should not be considered "feeder/growers"
  - No more than 2:1 patient:nurse ratio
  - Requires a lot of hands-on time
  - Requires a lot of parent teaching, mentoring, and support
- Requires that care providers be committed to maximizing non-pharmacologic care treatments
- Providers and parents should be committed to the avoidance of pharmacological treatment unless absolutely necessary

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### Key Point

*We should not be reinforcing to parents the idea that medication is the quick fix for mild discomfort or annoying behavior.*

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## We are the Gatekeepers

- You have a captive audience – for days, weeks or longer
- Mom may be more open to change now than at any other time in her life, but she needs acceptance, support, and guidance that we all can provide
- Encourage her to not only participate but be the primary caregiver with your coaching

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## “Why get her involved if the baby is just going to be taken away?”

- Our attitude directly influences parent trust
- Many women find that the birth of their child is a strong motivator to change their lifestyle and behaviors
- Goal should be maintenance of the family
  - Support mother's sobriety
  - Safety of the child is the first priority
- Barring abuse or neglect, children do better with their parents, even if the home does not meet our criteria

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## Discharge Plan and Teaching

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## Discharge Plan and Teaching

- Involve home care programs - the more the better
  - CPS can be of help with requiring participation
  - Keep eyes and ears in the home
- Close follow up after discharge
  - Initial pediatrician visit should be scheduled within 2-3 days of discharge
  - Developmental follow-up referral through 2 years of age at least
  - Vision follow-up at about 6 months of age
  - Make all appointments prior to discharge

SOURCE: Batakrisnan, M. Management of neonatal abstinence syndrome: the importance of a multifaceted program spanning inpatient and outpatient care. The Joint Commission Journal on Quality and Safety, 2018, Volume 44, Issue 6, pp. 309-311.

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## Discharge Plan and Teaching (cont.)

- If the parents have been involved as care givers throughout the stay, discharge is much easier-you've already done the teaching
- Remind mom to not abruptly discontinue breastfeeding
- Discuss her plan for help
  - Remind her that her baby is likely going to present challenges for months
- Ask tough questions: What is your plan for cravings/relapse?

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## A Mom with a Drug Abuse Problem is not a Bad Mom, She is a Mom with a Bad Problem

- There will always be drugs and the misuse/abuse of them
- We can offer harm reduction
- We need to focus on breaking the cycle of use where we can
  - Use supportive models of care
  - Teach and support parenting
  - Support families and recovery

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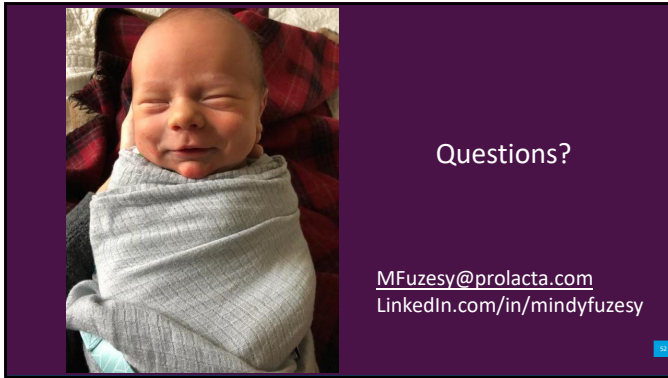
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