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April 21st Testimony Outline –

Introduction

- Joined GHS in 1999. Trained in NYC, Philadelphia, and Washington DC.

Our regional experience –

- In 15 years we've gone from 2 infants per year to 2 per month at GMC and 2 per month at GWV
- Additionally several of our community hospitals have been educated on and treat newborns locally

Began partnering with colleagues first through the efforts of Gateway Health Plan in Pittsburgh and more recently through Vermont Oxford Network on a national basis.

- Developed standardized approach and educational material for families impacted by NAS
- Attempt to connect with mothers prenatally through our Center for Prenatal Pediatrics

Review what NAS is and how we manage it (using PP as the basis with no intent to go over all slides but I can't pass up an opportunity to educate).

NEONATAL ABSTINENCE SYNDROME

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Neonatal Abstinence Syndrome

- What is NAS? NAS refers to a constellation of typical signs & symptoms of withdrawal that occur in infants that have been exposed to, and have developed dependence to, certain illicit drugs or prescription medications during fetal life.
- Characterized by central nervous system irritability, gastrointestinal dysfunction, and autonomic abnormalities.

How big a problem?

- From 2000-2009:
  - Length of hospital stay for NAS 15.8 vs. 16.4 days
  - Charges $39k vs $53k
  - 1 baby per hour born in the US will develop NAS
  - Recently increased to 1 baby per 24 minutes
- SAMHSA 2011 frequency of substance abuse
  - 20.9% pregnant teens
  - 8.2% pregnant 18-25 year olds
  - 5% any pregnant woman

What is drug addiction?

NIDA

- A chronic, relapsing brain disease that is characterized by compulsive drug seeking and use, despite harmful consequences.
- It is considered a brain disease because drugs change the brain – they change its structure and how it works.

Why do people take drugs?

- To feel good
  - Feelings of intense pleasure/euphoria
- To feel better
  - Those with social anxiety, stress-related disorders, and depression
- To do better
  - Chemical enhancement
- Curiosity and "because others are doing it"

Why do some people become addicted and others don't?

- Based on risk factors – the more risk factors you have the more likely you are to become addicted. There are also "protective" factors.
  - Biology/genes – genetics, gender, mental disorders
  - Environment – chaotic home life, parents' use, community attitudes, poor school achievement.
  - Drug – route of use, effect, cost, availability

Drugs & Substances of Abuse

- Drugs/substances of **abuse** in pregnancy based on frequency of use
  - Cigarettes (most common)
  - Alcohol
  - Marijuana
  - Non-medical uses of prescription drugs
    - Includes "street use" of subutex and methadone
  - Cocaine
  - Hallucinogens
  - Heroin (least common)

Drugs of Abuse

- Substances associated with NAS –
  - Opiates/opioids – heroin, morphine, codeine, opium, methadone,buprenorphine, fentanyl, demerol, percodan, darvon, oxycodone,…..
  - Alcohol
  - Benzodiazepines – valium, librium, placidyl, xanax, atarax,….
  - Barbiturates

- Substances **not** associated with NAS
  - Cocaine, antidepressants (except SSRI's), and/or amphetamines may experience symptoms that resemble NAS but are actually toxic effects of these drugs on the CNS
  - Caffeine, marijuana, tobacco, and volatile substances have been associated with abnormal neurobehavioral findings that typically subside within a few days & for which only supportive care is indicated.

Substance Abuse Treatment

- Old practice – treat with methadone short term then wean off
- New practice – treatment is ongoing and there are options.
  - Only 10-20% of patients who discontinue maintenance therapy remain abstinent.
- What do we see – an increasing number of mothers on treatment either prior to pregnancy or who go on treatment during pregnancy
  - This is our number one population contributing to infants with NAS

Treatment in Pregnancy

- Methadone first used to treat drug dependency in the 1960's.
  - Began using in pregnancy in the 1970's.
  - Requires daily visits to a methadone center
- Buprenorphine (also known as Subutex/Suboxone)
  - Treatment alternative
  - Able to be prescribed "locally" after special training through DEA
  - Does not require daily visits
  - Shown to be superior to methadone during the MOTHER study (published in 2010)

SIGNIFICANT OUTCOMES

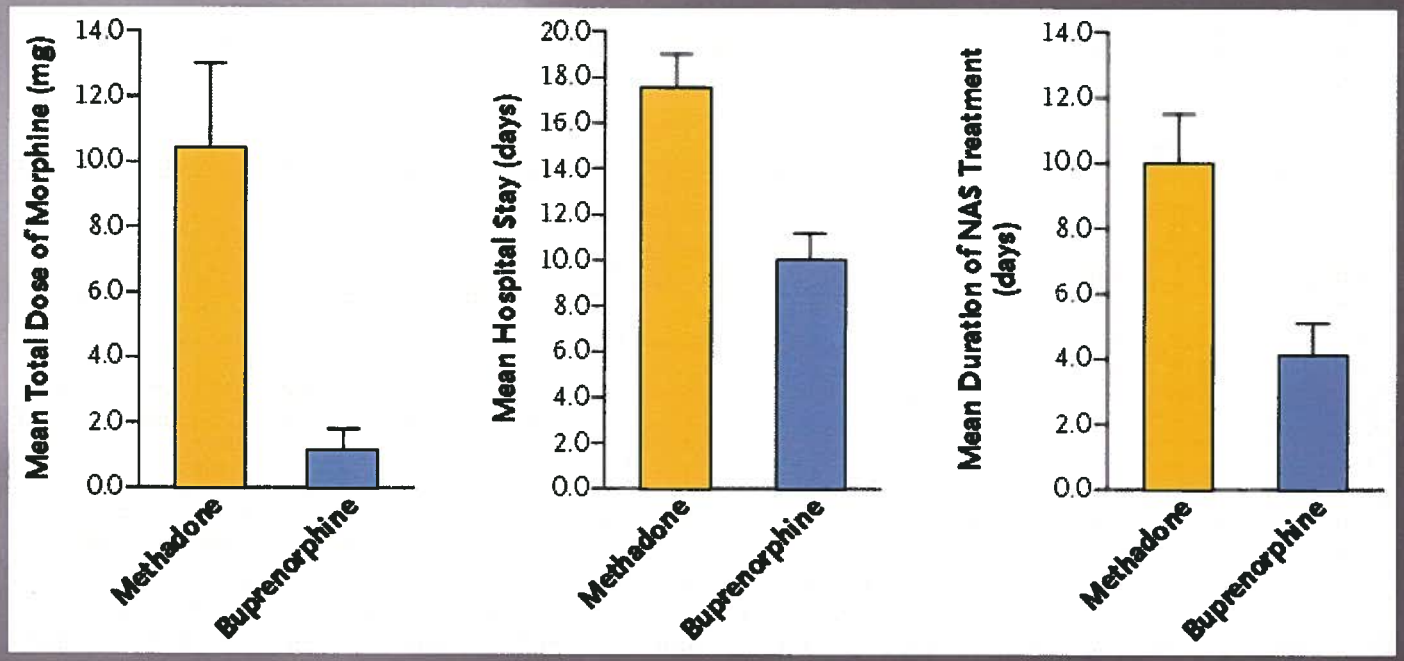

Figure 7. Mean Neonatal Morphine Dose, Length of Neonatal Hospital Stay, Duration of Treatment

Clinical Course for Infant with NAS

- Timing of onset of symptoms is variable and depends on the drug(s), timing, and amount of last maternal use, as well as maternal and infant metabolism, and rate of excretion.
- Majority of withdrawal starts within 72 hours of birth.
- Withdrawal may be multiphasic based on the substances a newborn was exposed to in utero

Timing

DRUG	ONSET of SYMPTOMS
Alcohol	3 – 12 hrs
Opiates	48 – 72 hrs
Barbiturates	4 – 7 days
Benzodiazepine	1 – 2 weeks

Treatment

- First try supportive non-pharmacological interventions – successful ~30% of the time
  - Quiet, private environment for care w/ dim lighting.
  - Frequent feedings of regular or hypercaloric formula (methadone and buprenorphine are not contraindicated in breast feeding)
  - Swaddling, rocking – side to side, swinging.
  - Soft music
  - Pacifier
  - Soft bedding to minimize excoriations
  - Frequent diaper changes
- When supportive treatment fails most begin infants on oral morphine and titrate based on clinical response using a tool called the Finnegan score

Breastfeeding

- Not contraindicated with methadone or buprenorphine
- Contraindicated with cocaine, heroin, marijuana, and heavy alcohol use
- Contraindicated in HIV-positive mothers
- Mother's with hepatitis should be counseled that while breastfeeding is not contraindicated, theoretically viral transmission may occur.

Discharge

- Length of hospitalization varies depending on drug used, severity of withdrawal, and social factors.
  - Our average length of stay at GMC is 14 days for those infant admitted to the NICU for treatment
  - But ~40% of infants whose mother's received buprenorphine are able to go home from our nursery
- Need to establish close follow up with PCP
- Parental education should be ongoing throughout the hospitalization and must include signs & symptoms of withdrawal.
- Early Intervention and/or Developmental Follow up is indicated