Neonatal Abstinence Syndrome: A Tennessee Perspective

John J. Dreyzehner, MD, MPH
Commissioner
HELLO

my name is

Tennessee
Objectives

• Describe the origins and approach to mitigating the Substance Abuse Epidemic and resulting NAS epidemic
• Review etiology, diagnosis, and management of NAS and scope of NAS in Tennessee
• Describe Tennessee interventions to reduce the burden of NAS
Substance Abuse & Misuse: Mitigating the Epidemic / Constraining the Market
Constraining Takes All Three

Substance Abuse & Misuse: Mitigating the Epidemic / Constraining the Market

Celebrate Recovery

Serenity Courage Wisdom

Prevention

Treatment

Control
Morphinism in its Relation to the Sexual Functions and Appetite, and its Effect on the Offspring of the Users of the Drug.

BY T. J. HAPPEL, M. D., TRENTON.

In an article by Lancereaux, of Paris, in which he describes the condition resulting from the long continued and excessive use of morphine, he says: "The special senses are not particularly injured, but the sexual appetite is

There can be no possible trouble of understanding: rationale of cyanosis in children born of morphine habitué, if one has ever once witnessed the horrible agony of a morphine slave when it was taken from him. It has been aptly described as "the tortures of the damned."

In every case of cyanosis in the new born infant, the treatment must be then to ascertain, if possible, the habits of the mother in regard to the use of opiates. This will be found no easy task. The confirmed user of the drug will deny the fact as promptly as the question is asked, but the inquiry must not stop with the mother alone. The husband and nurse must be interrogated, and still if no light is thrown upon the question, if there is the least reason to suspect the habit, opiates in tentative doses, either in the form of Tr. Opii Camp. or Pulv. Ipecac Co. must be cautiously given. If the infant is found to tolerate them well, your case can be taken as almost proven. Under the supervision of the physician, the opium and the whiskey, after you have quieted the child fully, must be slowly and carefully withdrawn, being sure not to reduce the dose too rapidly.

I may have discovered nothing new. I do not claim that, but I propose to put upon record my own experience with a limited number of opium takers.

It was the celebrated Dr. Bowling, I believe, who said that if we all read more, we would find that we had discovered fewer new things. I do not find the literature as abundant upon this subject as it ought to be hence this small mite.
Origins and approach to mitigating the Substance Abuse Epidemic and resulting NAS epidemic
Near Tripling in Opioid-related Deaths (in parallel with opioid sales and Rx opioid treatment admits)

2011 OD Deaths (U.S.):
- 41,340 Any Drug
- 22,810 Rx drug
- 16,917 Rx opioid
- 4,397 Heroin

Sources: National Vital Statistics System, DEA Automation of Reports and Consolidated Orders System, SAMHSA TEDS
How We got Here

A PAIN-DRUG CHAMPION HAS SECOND THOUGHTS

“Dr. Portenoy and other pain doctors who promoted the drugs say they erred by overstating the drugs’ benefits and glossing over risks.”

“…urged tackling what they called an epidemic of untreated pain…[and]…campaigned to make pain…‘the fifth vital sign’ that doctors should monitor, alongside blood pressure, temperature, heartbeat and breathing.”

“In 1998, the Federation of State Medical Boards released a recommendation policy reassuring doctors they wouldn’t face regulatory action for prescribing even large amounts of narcotics…In 2004, the group called on state medical boards to make undertreatment of pain punishable for the first time…That policy was drawn up with the help of several people with links to opioid makers…the federation said it received nearly $2 million from opioid makers since 1997.”

“In 2001, the Joint Commission, which accredits U.S. hospitals, issued new standards telling hospitals to regularly ask patients about pain and to make treating it a priority…The Joint Commission published a guide sponsored by Purdue Pharma. ‘Some clinicians have inaccurate and exaggerated concerns’ about addiction, tolerance and risk of death, the guide said. ‘This attitude prevails despite the fact there is no evidence that addiction is a significant issue when persons are given opioids for pain control.’”
Looking Back...

...Is this the right order?

1990’s
- Questionable Potential Benefits
  - 1995: Contingent of doctors urge treating pain as the “fifth vital sign”

2000’s
- Popular/Professional Push for Adoption
  - 2001: Joint Commission issues standards to treat pain
- Legislative Push for Adoption
  - 2001: TN passes Intractable Pain Treatment Act

And now...
- Tragic unintended, ongoing consequences
- 2007: Pardue Pharma pleads guilty on OxyContin case
- 2015: TN repeals Intractable Pain Treatment Act
“Ask your doctor if taking a pill to solve all your problems is right for you.”
A simplified schematic of “transmission” in the substance abuse epidemic

- Not everyone who misuses will abuse
- Not everyone who overdoses will die
- Not all misuse/abuse with pregnancy will result in NAS
- Resistance/Immunity-some have innate or acquired ‘resistance’
TN’s Prescription Drug Problem

Data source: Tennessee Department of Health; Controlled Substance Monitoring Database.
Deaths Due to Drug Overdose, Tennessee, 1999-2013

Data Source: Tennessee Department of Health, Division of Policy, Planning and Assessment, Death Statistical System

Overdose deaths were defined as having underlying cause of death ICD-10 codes X40-X44, X60-X64, X85, and Y10-Y14
Data Source: Tennessee Department of Health, Division of Policy, Planning and Assessment, Death Statistical System

Overdose deaths were defined as having underlying cause of death ICD-10 codes X40-X44, X60-X64, and Y10-Y14
Dopamine is released by pleasurable sensations:
  • Positive reward = pleasure and reinforced behavior seeking to repeat the pleasure

Dopamine is also released by avoidance of stress, pain or loss:
  • Negative reward = decreased motivation or depression

**Motivated Behavior:** Dopamine may reinforce behavior to obtain something good or reinforce behavior to avoid something bad
What else impacts pregnancy that involves our dopamine reward center?
Review scope, epidemiology diagnosis, and management of NAS in Tennessee
NAS Overview

Description

- A condition in neonates associated with withdrawal from intrauterine opioid exposure
- Symptoms include:
  - Seizures
  - Tremors
  - Crying
  - Hyperactivity
  - Poor feeding
- Withdrawal occurs in 55-94% of exposed infants

Etiology

- NAS can be associated with:
  - Prescription drugs obtained with prescription
    - Includes women on pain therapy or replacement therapy
  - Prescription drugs obtained without prescription
  - Illicit drugs

Diagnosis and Treatment

- NAS diagnosis based on:
  - History of exposure
  - Evidence of exposure (maternal drug screen; infant urine, meconium, hair, or umbilical samples)
  - Clinical signs (symptom rating scale)
- Initial treatment: monitor for signs of withdrawal and initiate pharmacologic treatment (typically with morphine or methadone) followed by a weaning program. Provide a quiet environment with little stimulation. Address other problems related to gastrointestinal symptoms according to severity.

Long Term Outcomes?

- No definitive long-term consequences of neonatal withdrawal
- Limited studies show:
  - Normalization of developmental assessment scores
  - Resolution of seizures
  - Confounding by social/environmental variables
Prenatal Drug Exposure

Infant with recognizable syndrome or signs

Pregnant women who use potentially harmful substances

All pregnant women

“Drug Exposed”
- Tobacco
- Illicit Drugs
- Prescription Drugs
- Alcohol
- Etc...

- Apparently “normal”
- Neonatal Abstinence Syndrome (NAS)
- Fetal Alcohol Syndrome
- Neurological abnormalities
- Prematurity
- Low birth weight
- Etc
# The Levels of Prevention

<table>
<thead>
<tr>
<th>PRIMARY Prevention</th>
<th>SECONDARY Prevention</th>
<th>TERTIARY Prevention</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Definition</strong></td>
<td>An intervention implemented before there is evidence of a disease or injury</td>
<td>An intervention implemented after a disease has begun, but before it is symptomatic.</td>
</tr>
<tr>
<td><strong>Intent</strong></td>
<td>Reduce or eliminate causative risk factors (risk reduction)</td>
<td>Early identification (through screening) and treatment</td>
</tr>
<tr>
<td><strong>NAS Example</strong></td>
<td>Prevent addiction from occurring</td>
<td>Screen pregnant women for substance use during prenatal visits and refer for treatment</td>
</tr>
<tr>
<td></td>
<td>Prevent pregnancy</td>
<td></td>
</tr>
</tbody>
</table>

Adapted from: Centers for Disease Control and Prevention. A Framework for Assessing the Effectiveness of Disease and Injury Prevention. MMWR. 1992; 41(RR-3); 001. Available at: [http://www.cdc.gov/mmwr/preview/mmwrhtml/00016403.htm](http://www.cdc.gov/mmwr/preview/mmwrhtml/00016403.htm)
Unintended Pregnancy Among All Women & Opioid Abusers

Impacted by:
- Type of opioid (half-life, dose, relative strength)
- Additional substances
- Timing of maternal drug usage
- Infant metabolism
- Gestational age and/or birth weight
- Timing of last maternal use
- May take as many as 4-5 days to appear
- Occur in 55-94% of exposed infants
  - Opioid withdrawal symptoms:
    - May appear as early as within the first 24 hours; Half-life
      » Short
        • heroin
          Often with 24 hours
      » Long
        • methadone
          24 to 72 hours
          • buprenorphine
            40 hours (some sources 19-200 hours)
Babies with prenatal drug exposure are more likely to:

- Be delivered by cesarean (OR 1.5-1.9)
- Be born pre-term (OR 3.7-4.6)
- Be born at low birth weight (OR 4.1-5.2)
- Have feeding problems (OR 8.2-10.3)
- Have respiratory distress syndrome (OR 3.4-5.3)

Prenatal Opioid Exposure Outcomes

• **National Birth Defects Prevention Study (1997-2005)** → Increased risk of:
  – Spina bifida (OR 1.3-3.2)
  – Gastrochisis (OR 1.1-2.9)
  – Any heart defect (OR 1.1-1.7)
    • AVSD (OR 1.2-4.8)
    • Tetralogy of Fallot (OR 1.1-2.8)
    • VSD (OR 1.1-6.3)
    • Hypoplastic Left Heart Syndrome (OR 1.4-4.1)
    • RVOT defects (OR 1.1-2.3)
    • Pulmonary valve stenosis (OR 1.2-2.6)

NAS Outcomes

• No definitive long-term syndrome associated with neonatal opioid withdrawal

• Limited studies show:
  – Mixed outcomes of developmental assessment scores (hyperactivity, short attention span, memory and perceptual problems)
  – Resolution of seizures

• Confounding by social/environmental variables
NAS Subcabinet Working Group

• Convened in late Spring 2012
• Committed to meeting every 3-4 weeks
• Cabinet-level representation from Departments:
  – Public Health (TDH)
  – Children’s Services (DCS)
  – Human Services (DHS)
  – Mental Health and Substance Abuse Services (DMHSAS)
  – Medicaid (TennCare)
  – Children’s Cabinet
Drug Dependent Newborns (Neonatal Abstinence Syndrome)
Surveillance Summary For the Week of April 5 – April 11, 2015

**Reporting Summary (Year-to-date)**
Cases Reported: 208
- Male: 117
- Female: 91
Unique Hospitals Reporting: 26

<table>
<thead>
<tr>
<th>Maternal County of Residence (By Health Department Region)</th>
<th># Cases</th>
<th>% Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Davidson</td>
<td>17</td>
<td>8.2</td>
</tr>
<tr>
<td>East</td>
<td>42</td>
<td>20.2</td>
</tr>
<tr>
<td>Hamilton</td>
<td>5</td>
<td>2.4</td>
</tr>
<tr>
<td>Jackson/Madison</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Knox</td>
<td>23</td>
<td>11.1</td>
</tr>
<tr>
<td>Mid-Cumberland</td>
<td>24</td>
<td>11.5</td>
</tr>
<tr>
<td>North East</td>
<td>31</td>
<td>14.9</td>
</tr>
<tr>
<td>Shelby</td>
<td>8</td>
<td>3.9</td>
</tr>
<tr>
<td>South Central</td>
<td>12</td>
<td>5.8</td>
</tr>
<tr>
<td>South East</td>
<td>1</td>
<td>0.5</td>
</tr>
<tr>
<td>Sullivan</td>
<td>20</td>
<td>9.6</td>
</tr>
<tr>
<td>Upper Cumberland</td>
<td>23</td>
<td>11.1</td>
</tr>
<tr>
<td>West</td>
<td>2</td>
<td>1.0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>208</strong></td>
<td><strong>100.2</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Source of Maternal Substance (if known)</th>
<th># Cases</th>
<th>% Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supervised replacement therapy</td>
<td>123</td>
<td>59.1</td>
</tr>
<tr>
<td>Supervised pain therapy</td>
<td>25</td>
<td>12.0</td>
</tr>
<tr>
<td>Therapy for psychiatric or neurological condition</td>
<td>14</td>
<td>6.7</td>
</tr>
<tr>
<td>Prescription substance obtained WITHOUT a prescription</td>
<td>67</td>
<td>32.2</td>
</tr>
<tr>
<td>Non-prescription substance</td>
<td>51</td>
<td>24.5</td>
</tr>
<tr>
<td>No known exposure but clinical signs consistent with NAS</td>
<td>3</td>
<td>1.4</td>
</tr>
<tr>
<td>No response</td>
<td>3</td>
<td>1.4</td>
</tr>
</tbody>
</table>

1. Summary reports are archived weekly at: [http://health.tn.gov/MCH/NAS/NAS_Summary_Archive.shtml](http://health.tn.gov/MCH/NAS/NAS_Summary_Archive.shtml)
2. Total percentage may not equal 100.0% due to rounding.
3. Multiple maternal substances may be reported; therefore the total number of cases in this table may not match the total number of cases reported.
November 1, 2012

Margaret Hamburg, M.D.
Commissioner
U.S. Food and Drug Administration
10903 New Hampshire Avenue
Silver Spring, MD 20993

Dear Commissioner Hamburg:

We write out of grave concern for the health, developmental and life course consequences for babies whose antenatal environment includes substantial opioid analgesic exposure. We believe that a “black box warning” for these medications would help assure that women of childbearing age and their health care providers are aware of the serious risks associated with narcotic use during pregnancy. Possible content for the warning may be as follows:

WARNING: USE OF NARCOTIC ANALGESICS IN WOMEN OF CHILD BEARING AGE MAY CAUSE NEONATAL ABSTINENCE SYNDROME

This message would also promote a critical dialog between the patient and provider regarding considerations in planning for pregnancy or prevention of unintended pregnancy for women who are benefiting therapeutically from these powerful medications or who may be at risk for abusing them. This is a primary prevention approach essential to a long term solution to this rapidly growing problem.
FDA NEWS RELEASE
For Immediate Release: Sept. 10, 2013
Media Inquiries: Morgan Liscinsky, 301-796-0397, morgan.liscinsky@fda.hhs.gov
Consumer Inquiries: 888-INFO-FDA

FDA announces safety labeling changes and postmarket study requirements for extended-release and long-acting opioid analgesics

New boxed warning to include neonatal opioid withdrawal syndrome

The U.S. Food and Drug Administration today announced class-wide safety labeling changes and new postmarket study requirements for all extended-release and long-acting (ER/LA) opioid analgesics intended to treat pain.

“The FDA is invoking its authority to require safety labeling changes and postmarket studies to combat the crisis of misuse, abuse, addiction, overdose, and death from these potent drugs that have harmed too many patients and devastated too many families and communities,” said FDA Commissioner Margaret A. Hamburg, M.D. “Today's action demonstrates the FDA's resolve to reduce the serious risks of long-acting and extended release opioids while still seeking to preserve appropriate access for those patients who rely on these medications to manage their pain.”

The FDA is also requiring a new boxed warning on ER/LA opioid analgesics to caution that chronic maternal use of these products during pregnancy can result in neonatal opioid withdrawal syndrome (NOWS), which may be life-threatening and require management according to protocols developed by neonatology experts. NOWS can occur in a newborn exposed to opioid drugs while in the mother’s womb. Symptoms may include poor feeding, rapid breathing, trembling, and excessive or high-pitched crying.

The updated indication further clarifies that, because of the risks of addiction, abuse, and misuse, even at recommended doses, and because of the greater risks of overdose and death, these drugs should be reserved for use in patients for whom alternative treatment options (e.g., non-opioid analgesics or immediate-release opioids) are ineffective, not tolerated, or would be otherwise inadequate to provide sufficient management of pain; ER/LA opioid analgesics are not indicated for as-needed pain relief.

“The FDA's primary tool for informing prescribers about the approved uses of medications is the product labeling,” said Douglas Throckmorton, M.D., deputy director for regulatory programs in the FDA’s Center for Drug Evaluation and Research. “These labeling changes describe more clearly the risks and safety concerns associated with ER/LA opioids and will encourage better, more appropriate, prescribing, monitoring and patient counseling practices involving these drugs.”

Recognizing that more information is needed to assess the serious risks associated with long-term use of ER/LA opioids, the FDA is requiring the drug companies that make these products to conduct further studies and clinical trials. The goals of these postmarket requirements are to further assess the known serious risks of misuse, abuse, addiction, and overdose, as well as the risks associated with extended- and long-acting formulations used for chronic pain in non-opioid tolerant patients.
**TennCare Prior Authorization Form**

**Long Acting Narcotics**

---

**Member Information**

<table>
<thead>
<tr>
<th>Last Name</th>
<th>First Name</th>
<th>ID Number</th>
<th>Date of Birth</th>
</tr>
</thead>
</table>

---

---

**Prescriber Information**

---

**For female patients between the ages of 18 & 45, please complete questions 10 - 12**

10. **The use of opioid analgesics during pregnancy has been associated with neonatal abstinence syndrome.** Has this patient been counseled regarding the risks of becoming pregnant while receiving this medication, including the risk of neonatal abstinence syndrome?  □ Yes  □ No

11. **Is this patient currently utilizing a form of contraception?**  □ Yes  □ No

12. **Has access to contraceptive services been offered to this patient?**  □ Yes  □ No

---

Form available at:
https://tnm.providerportal.sxc.com/rxclaim/TNM/TC%20PA%20Request%20Form%20(Long%20Acting%20Narcotics).pdf
Reducing Neonatal Abstinence Syndrome

Pink NAS reminder messaging on all females of childbearing age
Steady reduction in the number of high-use patients since third quarter of 2012.

Survey of 800 CSMD users found:

- **71** percent had changed a treatment plan after viewing the patient’s information on the CSMD
- **73** percent said they are now more likely to discuss substance abuse issues with a patient
- **57** percent said they are now more likely to refer a patient for substance abuse treatment

2010-2014 Morphine Milligram Equivalents Dispensed in TN

2010-2014 Number of “Doctor and Pharmacy Shoppers” in CSMD
Plan for the Future:

1. **Decrease** the number of Tennesseans that **abuse** controlled substances.

2. **Decrease** the number of Tennesseans who **overdose** on controlled substances.

3. **Decrease** the amount of controlled substances dispensed in Tennessee.

4. **Increase** access to **drug disposal outlets**.

5. **Increase** access and quality of early intervention, treatment and recovery **services**.

6. **Expand collaborations** among state agencies.

7. **Expand** collaboration with other states.
Additional Legislative Actions

• Pregnant women get priority for state-funded substance-abuse treatment\(^1\)
  - Child cannot be removed solely due to maternal substance use if treatment initiated by 20 weeks gestation

• Opioid antagonist to people at risk of overdose\(^2\)
  - Immunity for people who administer opioid antagonist

• Allowance for misdemeanor prosecution if women illegally uses narcotic during pregnancy and baby harmed as a result\(^3\) (PC820)
  - Required 2-hr CME on controlled substance prescribing\(^4\)
  - 30-day dispensing limit for opioids and benzodiazepines\(^5\)

References:  1. TCA § 33-10-104;   2. TCA § 63-1-152;  3. TCA § 39-13-107;  4. TCA § 63-1-402;  5. TCA § 53-11-308
Local Public Health Pilots

- Screening, Brief Intervention, and Referral to Treatment (SBIRT) in Family Planning and Primary Care
- Partnership with methadone clinics—provide Depo-Provera and referral to Family Planning Clinic for voluntary reversible long-acting contraceptive (VRLAC)
- Counseling and VRLAC opportunity to female inmates of childbearing age
Drug Drop-Off/Take Back

• TDH partnered with Department of Environment & Conservation to place 92 drop-off boxes across Tennessee
  – Funded in part with CDC Core Violence and Injury Grant funds (TDH)

• Local “Take Back Days”
  – 23 locations in 2013
  – Department of Mental Health and Substance Abuse Services
  – Partnership w/ county substance abuse coalitions
Additional Activities

• TDH: Pilot w/ Families Free (Johnson City)
  – Recovery support and *wraparound services* for mothers delivering NAS infants
  – Funded with mix of MCH Block Grant and Medicaid Infant Mortality/Women’s Health grant

• DCS: Hospital Liaison
  – *DCS staff position at two Children’s Hospitals*
  – Coordinate efforts between hospital and regional DCS staff
Collaborative Research Projects

• 5 grants awarded to collaborative research partnerships
  – Address key NAS research questions
  – Answerable:
    • With TN data and expertise
    • Within one year
  – Funded with MCH Block Grant funds and Medicaid Infant Mortality/Women’s Health grant

RESEARCH TOPICS

• Development of a predictive model for NAS
• Barriers to contraception in women attending substance abuse programs
• Optimal management of the pregnant woman taking opioids
• Understanding and improving provider knowledge and behavior
• Understanding optimal management of the infant with NAS
Additional Legislative Actions

• Safe Harbor Act (TCA 33-10-104, 2013)
  – Pregnant women get priority for treatment
  – Child cannot be removed solely due to maternal substance use if treatment initiated by 20 weeks gestation

• HB1427/SB1631 (2014)
  – Authorizes licensed practitioners to prescribe opioid antagonist to person at risk of overdose (or family member, friend or other person in position to assist)
  – Immunity for prescribers and for people who administer antagonist
Additional Legislative Actions

• Public Chapter 820 (2014)
  – Mother can be prosecuted for misdemeanor if mother illegally uses narcotic drug and child born “addicted or harmed”
  – Addiction recovery program is affirmative defense
  – Two year sunset
Drug Drop-Off/Take Back

• TDH partnered with Department of Environment & Conservation to place 92 drop-off boxes across Tennessee
  – Funded in part with CDC Core Violence and Injury Grant funds (TDH)

• Local “Take Back Days”
  – 23 locations in 2013
  – Department of Mental Health and Substance Abuse Services
  – Partnership w/ county substance abuse coalitions
SBIRT Pilot

• Screening, Brief Intervention, and Referral to Treatment (SBIRT)
• Partnership with Department of Mental Health and Substance Abuse Services
  – SAMHSA Center for Substance Abuse Treatment, State SBIRT Grant
• Putnam County HD Pilot
  – Family Planning and Primary Care patients
  – Partnership with local mental health provider to facilitate referrals
  – Billable through TennCare
Additional Activities

• Knox County Health Department and East TN Regional Health Office
  – Partnership with methadone clinics—provide Depo-Provera and referral to Family Planning Clinic for long-acting reversible contraceptive

• East TN Regional Health Office
  – Primary Prevention Initiative (PPI) Project
  – Partnership with jails in Sevier and Cocke counties
  – Voluntary provision of long-acting reversible contraceptives to female inmates of childbearing age
  – 19 women have received LARCs thus far
Additional Activities

- **TDH: Pilot w/ Families Free (Johnson City)**
  - Recovery support and wraparound services for mothers delivering NAS infants
  - Funded with mix of MCH Block Grant and Medicaid Infant Mortality/Women’s Health grant

- **DCS: Hospital Liaison (Connie Gardner)**
  - Coordinate efforts between hospital and regional DCS staff

- **TIPQC: Reducing NAS Length of Stay**
  - Perinatal Quality Collaborative
  - Kickoff in February 2013 with 15 hospitals
Scope of NAS in TN & US
• Over the past decade:
  – 2.8-fold increase in NAS incidence
  – 4.7-fold increase in maternal opioid use
  – Increase in hospital costs $39,400 → $53,400
  – 78% charges to state Medicaid programs

NAS—Reportable Disease

Need for Real Time Reporting

- Previous estimates of NAS incidence came from:
  - Hospital discharge data (all payers but ~18 month lag)
  - Medicaid claims data (only ~9 month lag but only includes Medicaid)
- Need more real-time estimation of incidence in order to drive policy and program efforts

How

- Added NAS to state’s Reportable Disease list
  - Effective January 1, 2013
- Collaborated with state perinatal quality collaborative (TIPQC) to define reporting elements
  - Align required reporting elements with same data elements reported in hospital QI projects

Authority

- Health Commissioner has authority to add diseases to Reportable Disease list
  - Reportable disease—Any disease which is communicable, contagious, subject to isolation or quarantine, or epidemic...
  - Event—An occurrence of public health significance and required by the Commissioner to be reported in the List.

Caveats

- Important caveats:
  - Reporting is for surveillance purposes only.
  - Does not constitute a referral to any agency other than the Tennessee Department of Health.
  - Does not replace requirement to report suspected abuse/neglect.
Drug Dependent Newborns (Neonatal Abstinence Syndrome)
Surveillance Summary For the Week of April 5 – April 11, 2015

Reporting Summary (Year-to-date)
Cases Reported: 208
Male: 117
Female: 91
Unique Hospitals Reporting: 26

Maternal County of Residence (By Health Department Region) | # Cases | % Cases
--- | --- | ---
Davidson | 17 | 8.2
East | 42 | 20.2
Hamilton | 5 | 2.4
Jackson/Madison | 0 | 0
Knox | 23 | 11.1
Mid-Cumberland | 24 | 11.5
North East | 31 | 14.9
Shelby | 8 | 3.9
South Central | 12 | 5.8
South East | 1 | 0.5
Sullivan | 20 | 9.6
Upper Cumberland | 23 | 11.1
West | 2 | 1.0
Total | 208 | 100.2

Source of Maternal Substance (if known) | # Cases | % Cases
--- | --- | ---
Supervised replacement therapy | 123 | 59.1
Supervised pain therapy | 25 | 12.0
Therapy for psychiatric or neurological condition | 14 | 6.7
Prescription substance obtained WITHOUT a prescription | 67 | 32.2
Non-prescription substance | 51 | 24.5
No known exposure but clinical signs consistent with NAS | 3 | 1.4
No response | 3 | 1.4

1. Summary reports are archived weekly at: [http://health.tn.gov/MCH/NAS/NAS_Summary_Archive.shtml](http://health.tn.gov/MCH/NAS/NAS_Summary_Archive.shtml)
2. Total percentage may not equal 100.0% due to rounding.
3. Multiple maternal substances may be reported; therefore the total number of cases in this table may not match the total number of cases reported.
Source of Exposure: 2013-14 NAS Surveillance

- Prescription Drugs Only: 42.1% (2013) vs 46.6% (2014)
- Illicit/Diverted Drugs Only: 33.0% (2013) vs 28.7% (2014)
- Prescription and Illicit Drugs: 21.5% (2013) vs 22.7% (2014)
- Unknown: 3.4% (2013) vs 2.1% (2014)
NAS Reported Cases Exposure Sources

<table>
<thead>
<tr>
<th>Year</th>
<th>Mix of prescription and illicit substances</th>
<th>Substance exposure unknown</th>
<th>Only illicit/diverted substances</th>
<th>Only substances prescribed to mother</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>21.5%</td>
<td>3.4%</td>
<td>33.0%</td>
<td>42.1%</td>
</tr>
<tr>
<td>2014</td>
<td>22.7%</td>
<td>2.1%</td>
<td>28.7%</td>
<td>46.6%</td>
</tr>
</tbody>
</table>

P-value=0.03
NAS Rate by Region, 2013-2014

(Ordered West to East)
**Data Source:** Tennessee Department of Health, Division of Policy, Planning and Assessment. Hospital Discharge Data System and Birth Statistical System, (2002 – 2013), Nashville, TN.

Analysis includes inpatient hospitalization with age less than 1 and any diagnosis of drug withdrawal syndrome of newborn (ICD-9-CM 779.5). Hospital Discharge Data System records may contain up to 18 diagnoses. Infants were included if any of these diagnoses fields were coded 779.5. Note that these are discharge level data and not unique patient data.
## Narcotics and Contraceptive Use: TennCare Women, CY2012*

<table>
<thead>
<tr>
<th>Demographics</th>
<th>TennCare Women</th>
<th>Women Prescribed Narcotics (&gt;30 days supplied)</th>
<th>Narcotic Users Rate per 1,000</th>
<th>Women Prescribed Contraceptives and Narcotics</th>
<th>% of Women on Narcotics and Contraceptives</th>
<th>Women Prescribed Narcotics without Contraceptives</th>
<th>% of Women on Narcotics Not on Contraceptives</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Women</td>
<td>296,687</td>
<td>42,082</td>
<td>141.8</td>
<td>7,538</td>
<td>18%</td>
<td>34,544</td>
<td>82%</td>
</tr>
<tr>
<td>15 - 20</td>
<td>84,398</td>
<td>2,054</td>
<td>24.3</td>
<td>987</td>
<td>48%</td>
<td>1,067</td>
<td>52%</td>
</tr>
<tr>
<td>21 - 24</td>
<td>44,620</td>
<td>3,897</td>
<td>87.3</td>
<td>1,432</td>
<td>37%</td>
<td>2,465</td>
<td>63%</td>
</tr>
<tr>
<td>25 - 29</td>
<td>53,333</td>
<td>8,689</td>
<td>162.9</td>
<td>2,199</td>
<td>25%</td>
<td>6,490</td>
<td>75%</td>
</tr>
<tr>
<td>30 - 34</td>
<td>48,912</td>
<td>10,442</td>
<td>213.5</td>
<td>1,699</td>
<td>16%</td>
<td>8,743</td>
<td>84%</td>
</tr>
<tr>
<td>35 - 39</td>
<td>37,483</td>
<td>9,319</td>
<td>248.6</td>
<td>805</td>
<td>9%</td>
<td>8,514</td>
<td>91%</td>
</tr>
<tr>
<td>40 - 44</td>
<td>27,940</td>
<td>7,681</td>
<td>274.9</td>
<td>416</td>
<td>5%</td>
<td>7,265</td>
<td>95%</td>
</tr>
</tbody>
</table>

Data source: Division of Health Care Finance and Administration, Bureau of TennCare. *CY2012 data is provisional.*
### TennCare NAS Costs, CY2012*

Data source: Division of Health Care Finance and Administration, Bureau of TennCare.  *CY2012 data is provisional.*

1. This sample contains only children that were directly matched to TennCare’s records based on Social Security Number.
2. Any infant weighing under 2,500g at the time of birth was considered low birth weight (LBWT).

<table>
<thead>
<tr>
<th>Metric</th>
<th>TennCare Paid Live Births¹</th>
<th>TennCare non-LBWT Births</th>
<th>TennCare Live LBWT Births²</th>
<th>NAS Infants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Births</td>
<td>42,171</td>
<td>37,576</td>
<td>4,595</td>
<td>736</td>
</tr>
<tr>
<td>Cost for Infant in first year of life</td>
<td>$352,516,166</td>
<td>$177,959,049</td>
<td>$174,557,118</td>
<td>$45,870,410</td>
</tr>
<tr>
<td>Average Cost per child</td>
<td>$8,359</td>
<td>$4,736</td>
<td>$37,988</td>
<td>$62,324</td>
</tr>
<tr>
<td>Average length of stay (days)</td>
<td>3.5</td>
<td>2.0</td>
<td>15.8</td>
<td>26.2</td>
</tr>
</tbody>
</table>

---

*TY2012 data is provisional.*
## Cost of NAS in Tennessee

### Impact of NAS on Infant Health Care Expenditures, CY 2011

<table>
<thead>
<tr>
<th>Metric</th>
<th>TennCare Paid Live Births&lt;sup&gt;1&lt;/sup&gt;</th>
<th>TennCare non-LBWT Births</th>
<th>TennCare Live LBWT Births&lt;sup&gt;2&lt;/sup&gt;</th>
<th>NAS Infants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Births</td>
<td>45,205</td>
<td>40,437</td>
<td>4,768</td>
<td>528</td>
</tr>
<tr>
<td>Cost for Infant in first year of life</td>
<td>$350,936,293</td>
<td>$171,336,964</td>
<td>$179,599,329</td>
<td>$33,249,612</td>
</tr>
<tr>
<td>Average Cost per child</td>
<td>$7,763</td>
<td>$4,237</td>
<td>$37,668</td>
<td>$62,973</td>
</tr>
<tr>
<td>Average length of stay (days)</td>
<td>4.8</td>
<td>3.2</td>
<td>18.3</td>
<td>32.5</td>
</tr>
</tbody>
</table>

<sup>1</sup> This sample contains only children that were directly matched to TennCare’s records based on Social Security Number.

<sup>2</sup> Any infant weighing under 2,500g at the time of birth was considered low birth weight (LBWT).

### Percentage of Newborns in DCS Custody within One Year of Birth, CY 2011

<table>
<thead>
<tr>
<th></th>
<th>Infants born in CY 2011</th>
<th>NAS infants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total # of Infants</td>
<td>55,578</td>
<td>528</td>
</tr>
<tr>
<td>Total # infants in DCS</td>
<td>767</td>
<td>120</td>
</tr>
<tr>
<td>% in DCS</td>
<td>1.4%</td>
<td>22.7%</td>
</tr>
</tbody>
</table>
NAS—What Can You Do?

Help foster positive change:

1. Get your state to require reporting
   - Reporting drives action

2. Focus on Primary Prevention
   - Take care of potential moms

3. Stem Larger Epidemic

4. NAS can help create an greater understanding and acceptance ➔ desigmatization of the Disease of addiction.
MEDICAL MARIJUANA
POPULATION HEALTH PERSPECTIVE

Individual Benefits vs. Population Risks

WHAT WE KNOW

**Individual Benefits**
- Neuropathic pain reduction
- Lessens chemotherapy-related nausea and vomiting
- Reduces spasticity

**Population Risks**
- Increased Motor Vehicle Accidents
- Burn-related injuries
- Work related accidents

**Adults/Society**
- Insufficient evidence
- Decrease in perceived risks of drug use
- Increased use
- Increased rate of addiction
- Worsen psychotic disorders
- Lower educational attainment

**Adolescents/Young Adults**
- Lessens chemotherapy-related nausea and vomiting

**Infants/Children**
- Accidental poisoning
- Secondhand smoke
- Developmental delays
- Asthma

**Pregnancy/Breastfeeding**
- Insufficient evidence
- THC crosses placenta
- Adverse birth outcomes
- THC expressed in breast milk

“...You ought to wait a year or two. Let’s see if we can keep it out of the hands of kids. Let’s see that people aren’t driving while high. [Let’s] make sure there aren’t unintended consequences.”

- Colorado Governor John Hickenlooper 2014 advice to fellow governors

1 All evidence presented is substantial or moderate in strength. Citations available upon request.
Thank You!

Photo credit: Kevin Banks, In Color Creative