# Yale New Haven Children's Hospital Experience Developing and Instituting an Objective Protocol for Newborn Toxicology Testing: Collaboration for Health Equity

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# Objectives

- Reconsider the clinical utility of newborn toxicology testing
- Describe data on the clinical utility of extended-time frame testing (meconium and umbilical cord) vs short term testing (urine)
- Present guideline for newborn toxicology testing in the setting of prenatal substance exposure
- Present data demonstrating practice patterns before and after guideline implementation

# Biden-Harris Administration Plan

The Administration's vision is that all pregnant women with SUD will be identified early in pregnancy and prioritized to receive evidence-based treatment, services, and other recovery and social supports. Health care delivery will be well coordinated to optimize outcomes for families and prevent foster care placement where possible. Clear coordination of health care and early childhood systems, including public health, early learning, courts, child welfare systems, and family economic supports will optimize the outcomes for infants and pregnant women with SUD.

5. Improving coordination of public health, criminal justice systems, treatment and early childhood systems can optimize outcomes and reduce disparities.

3. Everyone has the right to effective treatment, and denying such care on the basis of sex or disability is a violation of civil rights.[23]
4. Pregnant women using substances or having SUD, should be encouraged to access support and care systems, and barriers to access should be addressed, mitigated, and eliminated where possible.
5. Improving coordination of public health, criminal justice systems, treatment and early childhood systems can optimize outcomes and reduce disparities.

Substance Use Disorder in Pregnancy:
Improving Outcomes for Families
(The White House
Executive Office of the President
Office of National Drug Control Policy)
Published 10/2022

# What are the effects of use during pregnancy?

## Substance A

- Possible increased risk of stillbirth
- Possible increased risk of preterm birth (mixed data)
- Possible increased risk of fetal growth restriction (mixed data)
- Possible adverse effects on neurodevelopment
- No established association with specific congenital anomalies

American Journal of Obstetrics & Gynecology DEC 2015 761-778

## Substance B

- Preterm delivery
- Poor intrauterine growth
- Abnormal facies and other structural problems (heart/limb/brain)
- Withdrawal
- Neuromuscular problems e.g. seizures, gross motor problems
- Behavioral, attention & cognitive problems leading to school difficulty
- Autism
- Increased risk of psychiatric disorders
- Socio-economic vulnerability
- Premature death

Addiction, March 2020, Volume: 115, Issue: 11: 2148-2163

## Substance C

- Miscarriage, stillbirth or preterm delivery
- Poor intrauterine growth
- SIDS or other infant death
- Birth defects including cleft lip/palate, clubfoot, gastroschisis, heart defects
- ADHD

Centers for Disease Control and Prevention [last updated 2017 Sep 29

# What are the effects of post-natal parental use?

## Substance A

- More likely that children will use cannabis and alcohol as adults.
- Risks associated with parental impaired judgement.

## Substance B

- Highly variable effects, at least partially depending on how parents communicate about use.
- If use disorder is a contributor, potential for significant negative psychological effects.
- Risks associated with parental impaired judgement.

## Substance C

- Ear infections
- Lung infections
- Asthma and chronic lung disease
- Allergies
- SIDS

*Psychol Addict Behav* 2019 Sept 9

Multiple sources

February 27, 2020 Office on Smoking and Health, National Center for Chronic Disease Prevention and Health Promotion

# Which is most concerning?

## CANNABIS

**STRENGTH OF EVIDENCE: WEAK**

Prenatal effects:

- Weak evidence for possible fetal growth restriction, possible effects on neurodevelopment
- Many unanswered research questions, recommendations tentative

Postnatal effects

- Possible higher risk of use of cannabis and alcohol as adults
- Risks related to parental impaired judgement

## ALCOHOL

**STRENGTH OF EVIDENCE: STRONG**

Prenatal effects

- Strong evidence for adverse pregnancy outcomes, fetal growth restriction, structural problems, neuromuscular problems, potentially life-long psychiatric and neurocognitive effects up to and including premature death
- Evidence base and recommendations well established

Postnatal effects

- Highly variable post-natal effects
- Potentially significant psychological impacts if alcohol use disorder involved
- Risks related to parental impaired judgement

## CIGARETTE SMOKING

**STRENGTH OF EVIDENCE: STRONG**

Prenatal effects

- Strong evidence for adverse pregnancy outcomes, fetal growth restriction, structural problems, increased risk for SIDS, potentially life-long neurocognitive effects
- Evidence base and recommendations well established

Postnatal effects

- Increased risk of SIDS
- Increased risk of ear infections, lung infections, asthma and chronic lung disease, allergies

- If we did toxicology testing with the intent of finding those things that were most concerning for the health of the pregnant patient, the viability of the pregnancy, and the health of the infant that may be born of the pregnancy, we would be testing for nicotine and alcohol metabolites.

# Which is most concerning?

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Postnatal effects

- Increased risk of SIDS
- Increased risk of ear infections, lung infections, asthma and chronic lung disease, allergies

## POVERTY
**STRENGTH OF EVIDENCE: STRONG**

Prenatal effects

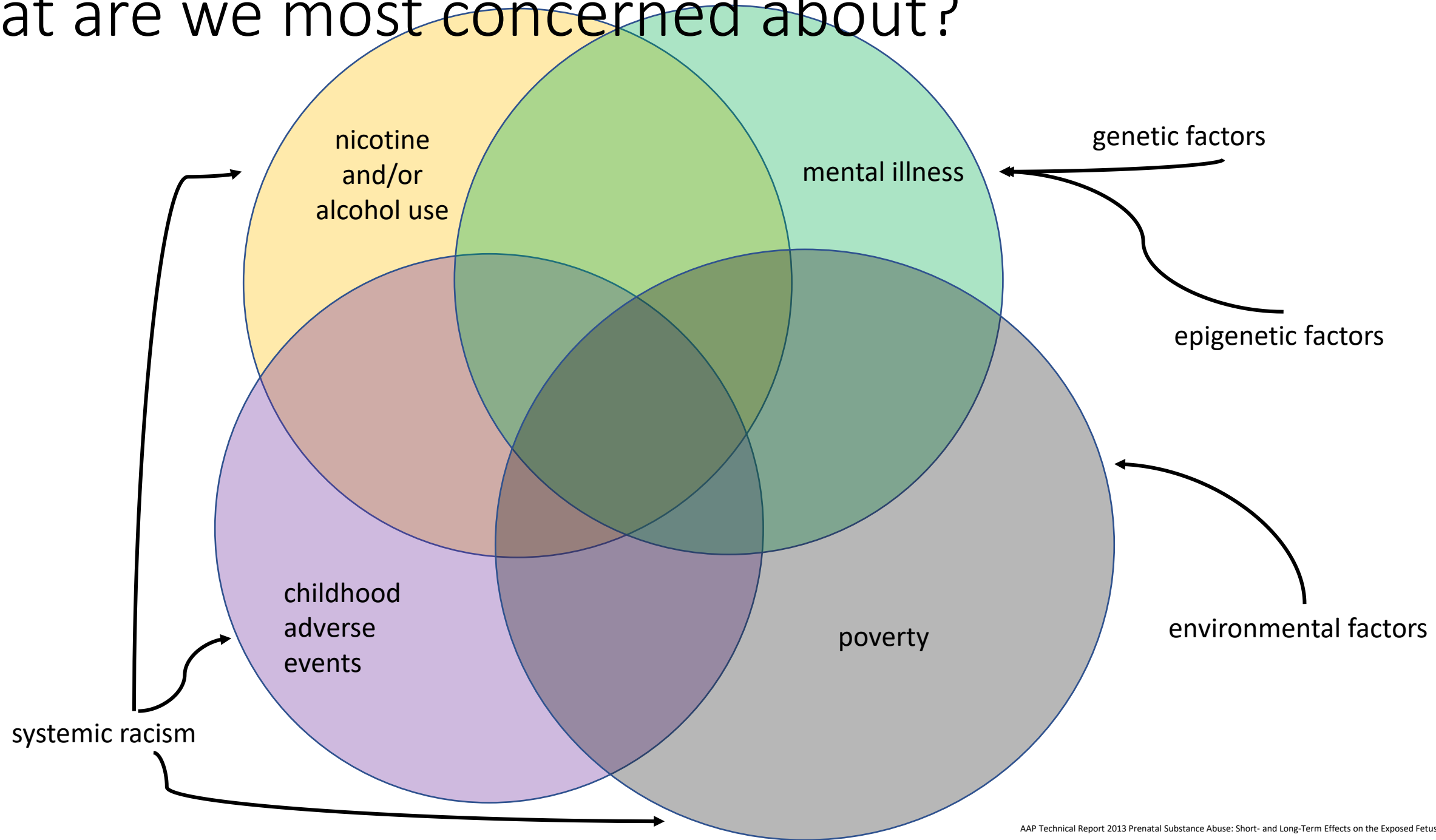
- Strong evidence for adverse pregnancy outcomes, fetal growth restriction, potentially life-long neurocognitive effects up to and including premature death

Postnatal effects

- Potentially significant psychological impacts
- Increased risks of accidents including accidental death
- Increased risk of illness including asthma and lung infections
- Increased risk of neurocognitive effects including unfulfilled potential educational and vocational achievement

Aber et al. THE EFFECTS OF POVERTY ON CHILD HEALTH AND DEVELOPMENT. *Annu. Rev. Public Health. 1997. 18:463–83*

# What are we most concerned about?




AAP Technical Report 2013 Prenatal Substance Abuse: Short- and Long-Term Effects on the Exposed Fetus

# What are the reasons to test?

- Does it provide new information (or is it redundant)?
  - Will it change medical management?
  - Will it change disposition?
  - Will it change anticipatory guidance?
  - Will it change follow up or specialist consultation?
  - Will it change the need for SW or DCF consultation?
- Will it affect DCF substantiation of claim of harm?
- Is it required by law?

# Is infant testing required to fulfill CAPTA requirements?

- There is no requirement for infant toxicology testing in the CAPTA legislation.

- No state requires universal toxicology testing of all newborns.
  - 2 states require testing if “drug-related complications” noted after delivery (Minnesota & North Dakota)
  - 4 states require testing if prenatal substance exposure is suspected or identified (Minnesota, North Dakota, Iowa, Kentucky)

# What are the reasons not to test?

- Are there harms of a child protective services referral?
- Will it demonstrate bias against people who use substances?
- Will it demonstrate racism and result in inequitable consequences for people of color?

# What kind of test?


**Specimen Collection Considerations**

| | Urine | Umbilical Cord | Meconium |
|---|---|---|---|
| Collection | Difficult | Easy | Moderate |
| Typical Turnaround Time | <4 hrs | 1–2 days | 12 hrs–2 days |
| Window of Detection | Short | Intermediate | Long |
| Drug Concentrations | Moderate | Low | High |
| Extent of Characterization | Moderate | Low | High |

**Facing Challenges in Neonatal Drug Testing**
**How Laboratory Stewardship Enhances Care for a Vulnerable Population**
**Author:** Jennifer M. Colby, PhD, and Steven W. Cotten, PhD **Date:** MAR.1.2018 **Source:** Clinical Laboratory News

# Evolution of newborn toxicology testing

- Urine testing

- 1989 – development of meconium testing

Drug screening of meconium in infants of drug-dependent mothers: An alternative to urine testing

Enrique M. Ostrea, Jr., MD, Mark J. Brady, Patricia M. Parks, Dennis C. Asensio, MD, and Alexander Naluz, MD

From the Departments of Pediatrics, Hutzel Hospital and Wayne State University, Detroit, Michigan

*The Journal of Pediatrics*
*September* 1989

# Evolution of newborn toxicology testing

- Urine testing
- 1989 – development of meconium testing
- 2006 – development of umbilical cord testing

## Testing for fetal exposure to illicit drugs using umbilical cord tissue vs meconium

**D Montgomery[1], C Plate[2], SC Alder[3], M Jones[2], J Jones[2] and RD Christensen[1]**

*[1]Department of Women and Newborns, Intermountain Health Care and McKay Dee Hospital, Ogden, UT, USA; [2]The United States Drug Testing Laboratories, Des Plaines, IL, USA and [3]Department of Family and Preventive Medicine, University of Utah, Salt Lake City, UT, USA*

**Journal of Perinatology (2006) 26**, 11–14

# To summarize this literature

- The reasons cited for sending these tests are not clinically valid to the care of the newborn
  - Successful treatment hinges on rapid identification of substance exposure
  - Need for accurate data on substance use during pregnancy in service of the goal of increased abstinence during pregnancy

# To summarize this literature

- Notable bias against those in poverty and those who use substances
- The validation of these tests occurred subsequently, but the original derivation of both meconium and umbilical cord testing did not even attempt to correlate with patient-reported substance use
- Acknowledgement throughout that fear of consequences to family was a reason for inaccuracy in patient report

# Review of all umbilical cord tests sent at L&M in the last 3 years (2019-2021)

- 33 tests (average 0.9 per month)
- Reasons for ordering
  - 21% for known opioid use disorder treatment only
  - 36% for known cannabis use only
  - 15% for known non-prescribed medication or substance use
  - 18% for “clinical concern”

# Review of all umbilical cord tests sent at L&M in the last 3 years

- ~55% positive result
- In 12% of cases, urine toxicology was also sent
  - Results were concordant between UCT and urine in 100% of cases
- Unexpected positive results (ie there was no known substance use but a clinical concern arose and a test resulted positive)
    - 0%
- Unexpected negative results (ie there was known substance use but the test resulted negative)
  - ~20%

# Review of all umbilical cord tests sent at L&M in the last 3 years

- Test results changed clinical care or treatment plan
  - 0%

- Test results changed Family Care Plan or disposition plan (ie home with family)
  - 0%

# Other sources corroborating concordance of umbilical/meconium and urine testing

- “Meconium did not appear to offer an advantage over maternal or neonatal urine for detection of cannabinoid, codeine, morphine, or methadone.”

Wingert WE, Feldman MS, Kim MH, Noble L, Hand I, Yoon JJ. A comparison of meconium, maternal urine and neonatal urine for detection of maternal drug use during pregnancy. J Forensic Sci. 1994 Jan;39(1):150-8. PMID: 8113697.

- No paper that attempts to compare these has any interview data to compare, so they are often blindly comparing apples (long-term testing) to oranges (short-term testing) and the idea of concordance does not apply

# If toxicology testing is deemed relevant to the clinical care of the newborn

- Urine toxicology testing is standard of care for withdrawal in adult population and is deemed appropriate for detection of substance resulting in withdrawal

UpToDate: Opioid withdrawal in adults: Clinical manifestations, course, assessment, and diagnosis

- Urine toxicology is the only kind of testing that provides actionable information

# Would universal testing provide equitable care to pregnant patients and families?

- While the testing would be distributed evenly, the downstream consequences (including who gets referred to DCF and whose families are separated, for how long, and at what cost) differ greatly

NYU Review of Law & Social Change 2019 The Harm of Child Removal Shanta Trivedi

# Our ultimate goals are…

- To identify substance use during pregnancy to counsel patients and enroll in treatment if indicated
  - Smoking cessation
  - Alcohol use cessation
  - Opioid use cessation including MOUD
  - Cannabis use cessation and/or risk mitigation
  - Cessation of other substances: cocaine, PCP etc
- To support parents in their responsibility of parenting
  - Treat associated mental health issues
  - Enroll in social assistance programs
- To provide the best start in life for newborns
  - Best evidence supports promoting families remaining together

NYU Review of Law & Social Change 2019 The Harm of Child Removal Shanta Trivedi

Mical Raz, Alan Dettlaff, Frank Edwards: The Perils of Child "Protection" for Children of Color: Lessons From History, *Pediatrics* July 2021; 148 (1).

# Previous practice pattern for newborn toxicology

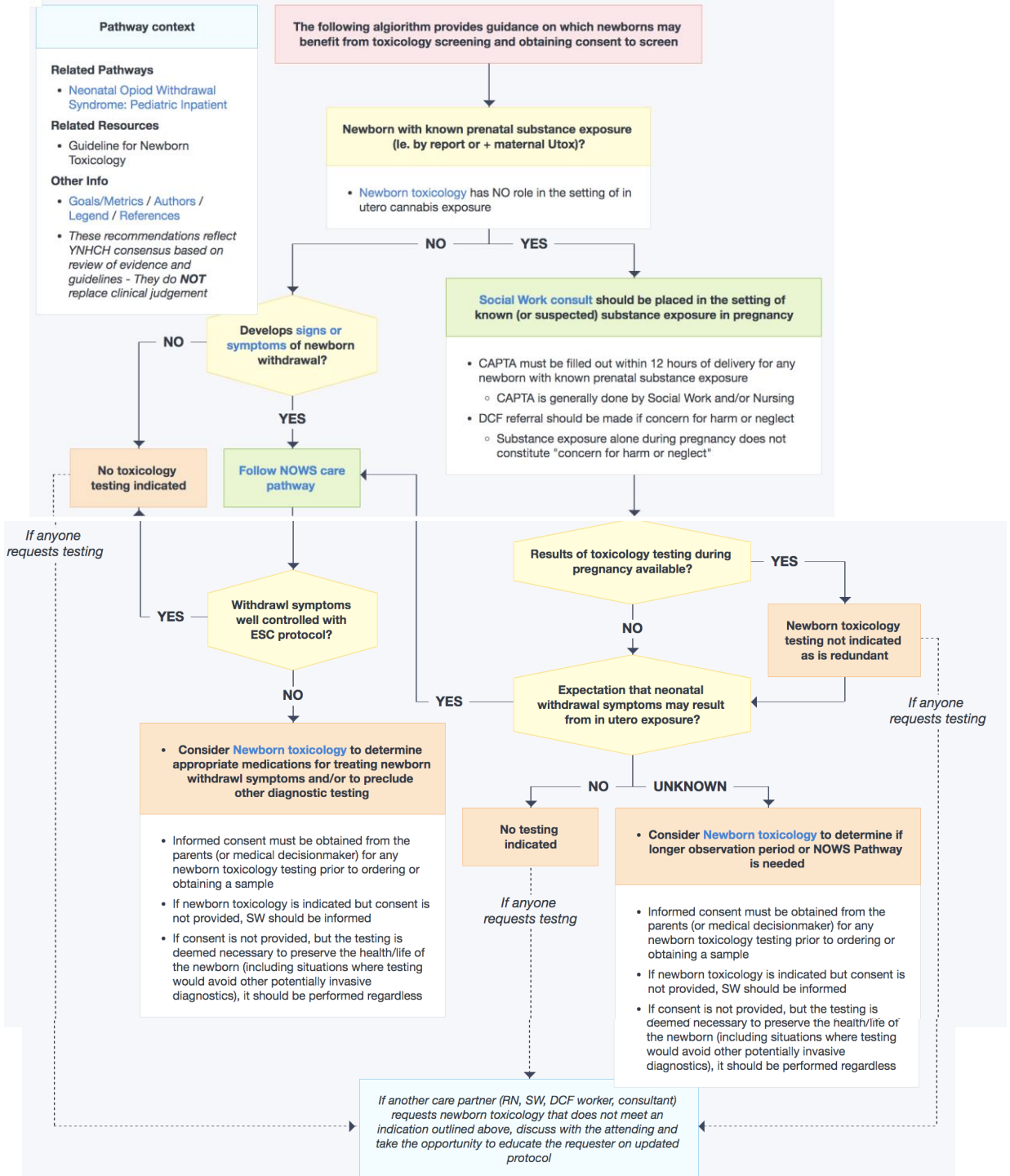
- Provider discretion, NOT UNIVERSAL TESTING
- Not testing in all cases of known prenatal substance exposure
- Not testing in all cases of known MOUD during pregnancy
- Mutual deference
  - Usually ordered when requested by SW or DCF (or expectation of this)
  - Per discussions with DCF, they thought they were ordered for medical purposes

Presler, C. (2021). Mutual Deference Between Hospitals and Courts: How Mandated Reporting from Medical Providers Harms Families. *Columbia Journal of Race and Law*, *11*(3), 733–766. https://doi.org/10.52214/cjrl.v11i3.8750

# Collaboration

- Pediatric Hospital Medicine Section
  - Section Chief
  - Medical Director of Newborn Nursery
- Child Abuse Section
- SW
- Pediatric and OB trainees
- NICU
- OB
- DCF
- Addiction Medicine
- Psychiatry

# The newborn toxicology pathway



**Pathway context**

**Related Pathways**

- Neonatal Opiod Withdrawal Syndrome: Pediatric Inpatient

**Related Resources**

- Guideline for Newborn Toxicology

**Other Info**

- Goals/Metrics / Authors / Legend / References
- *These recommendations reflect YNHCH consensus based on review of evidence and guidelines - They do **NOT** replace clinical judgement*

**The following algiorithm provides guidance on which newborns may benefit from toxicology screening and obtaining consent to screen**

**Newborn with known prenatal substance exposure (Ie. by report or + maternal Utox)?**

- Newborn toxicology has NO role in the setting of in utero cannabis exposure

**NO**

**Develops signs or symptoms of newborn withdrawal?**

**NO**

**No toxicology testing indicated**

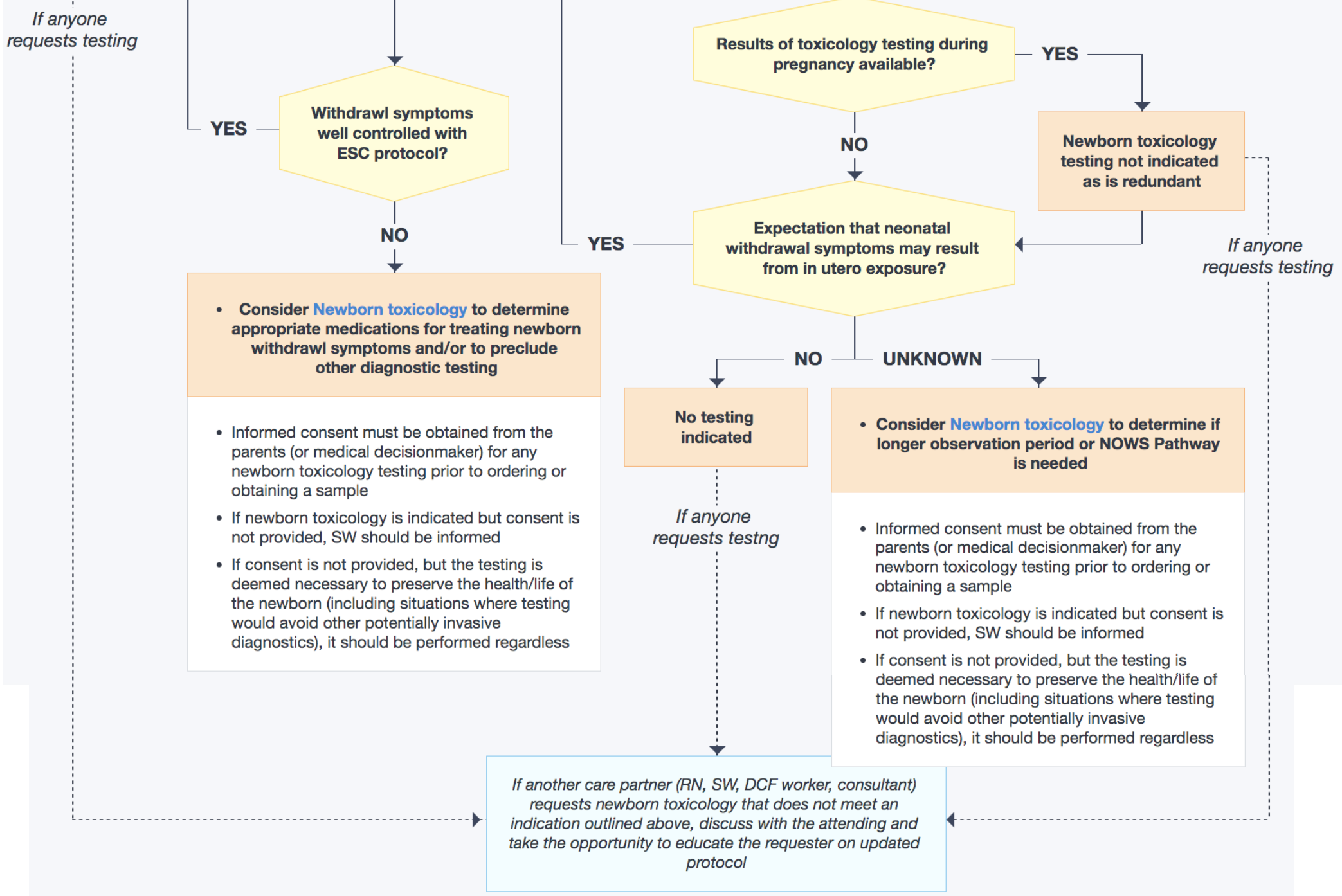
**YES**

**Follow NOWS care pathway**

**YES**

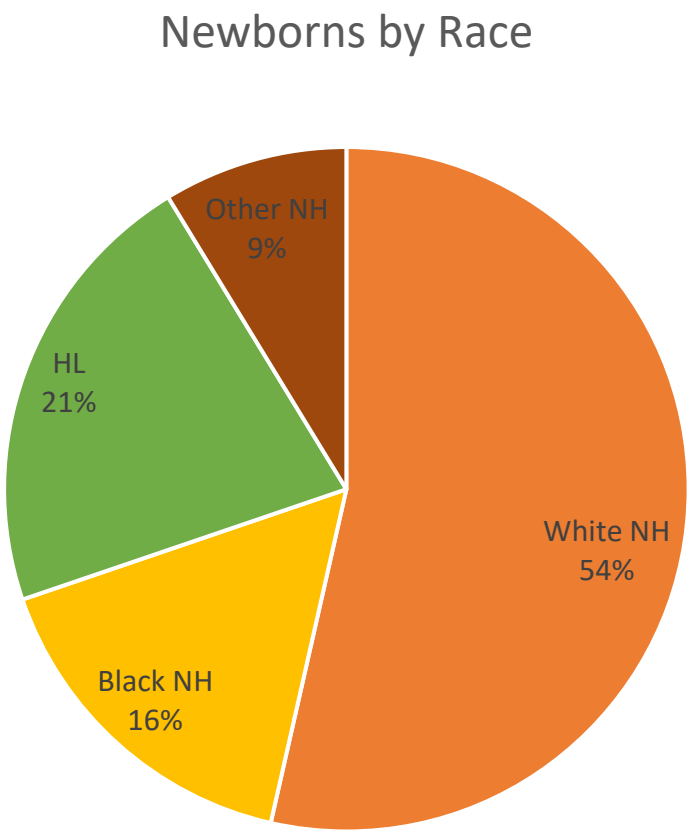
**Social Work consult should be placed in the setting of known (or suspected) substance exposure in pregnancy**

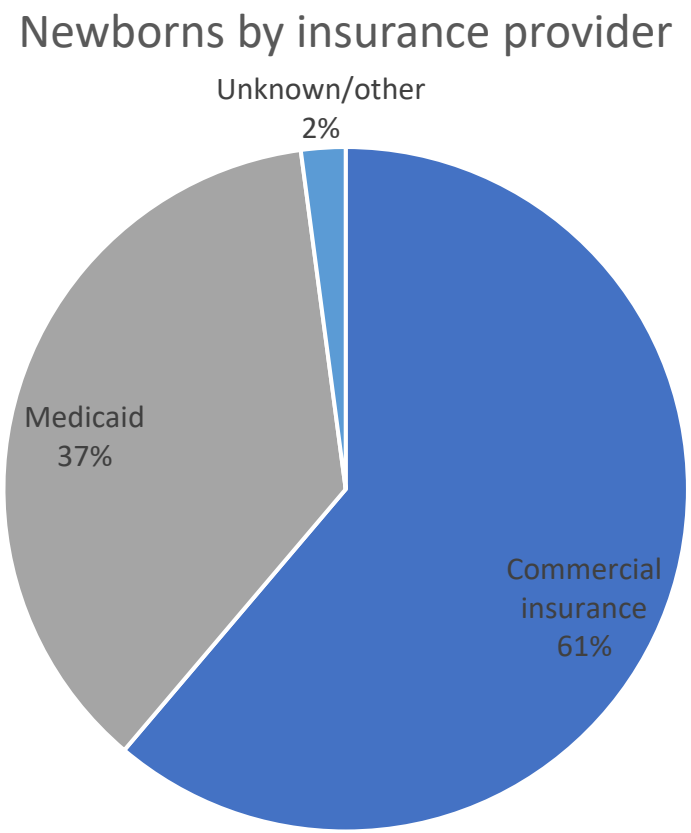
- CAPTA must be filled out within 12 hours of delivery for any newborn with known prenatal substance exposure
  - CAPTA is generally done by Social Work and/or Nursing
- DCF referral should be made if concern for harm or neglect
  - Substance exposure alone during pregnancy does not constitute "concern for harm or neglect"


If anyone requests testing
YES
Withdrawl symptoms well controlled with ESC protocol?
NO
Consider Newborn toxicology to determine appropriate medications for treating newborn withdrawl symptoms and/or to preclude other diagnostic testing
Informed consent must be obtained from the parents (or medical decisionmaker) for any newborn toxicology testing prior to ordering or obtaining a sample
If newborn toxicology is indicated but consent is not provided, SW should be informed
If consent is not provided, but the testing is deemed necessary to preserve the health/life of the newborn (including situations where testing would avoid other potentially invasive diagnostics), it should be performed regardless
Results of toxicology testing during pregnancy available?
YES
Newborn toxicology testing not indicated as is redundant
NO
YES
Expectation that neonatal withdrawal symptoms may result from in utero exposure?
If anyone requests testing
NO
UNKNOWN
No testing indicated
If anyone requests testng
Consider Newborn toxicology to determine if longer observation period or NOWS Pathway is needed
Informed consent must be obtained from the parents (or medical decisionmaker) for any newborn toxicology testing prior to ordering or obtaining a sample
If newborn toxicology is indicated but consent is not provided, SW should be informed
If consent is not provided, but the testing is deemed necessary to preserve the health/life of the newborn (including situations where testing would avoid other potentially invasive diagnostics), it should be performed regardless
If another care partner (RN, SW, DCF worker, consultant) requests newborn toxicology that does not meet an indication outlined above, discuss with the attending and take the opportunity to educate the requester on updated protocol

not for dissemination preliminary QI data

# The before times (1/1/2019-12/31/2020)



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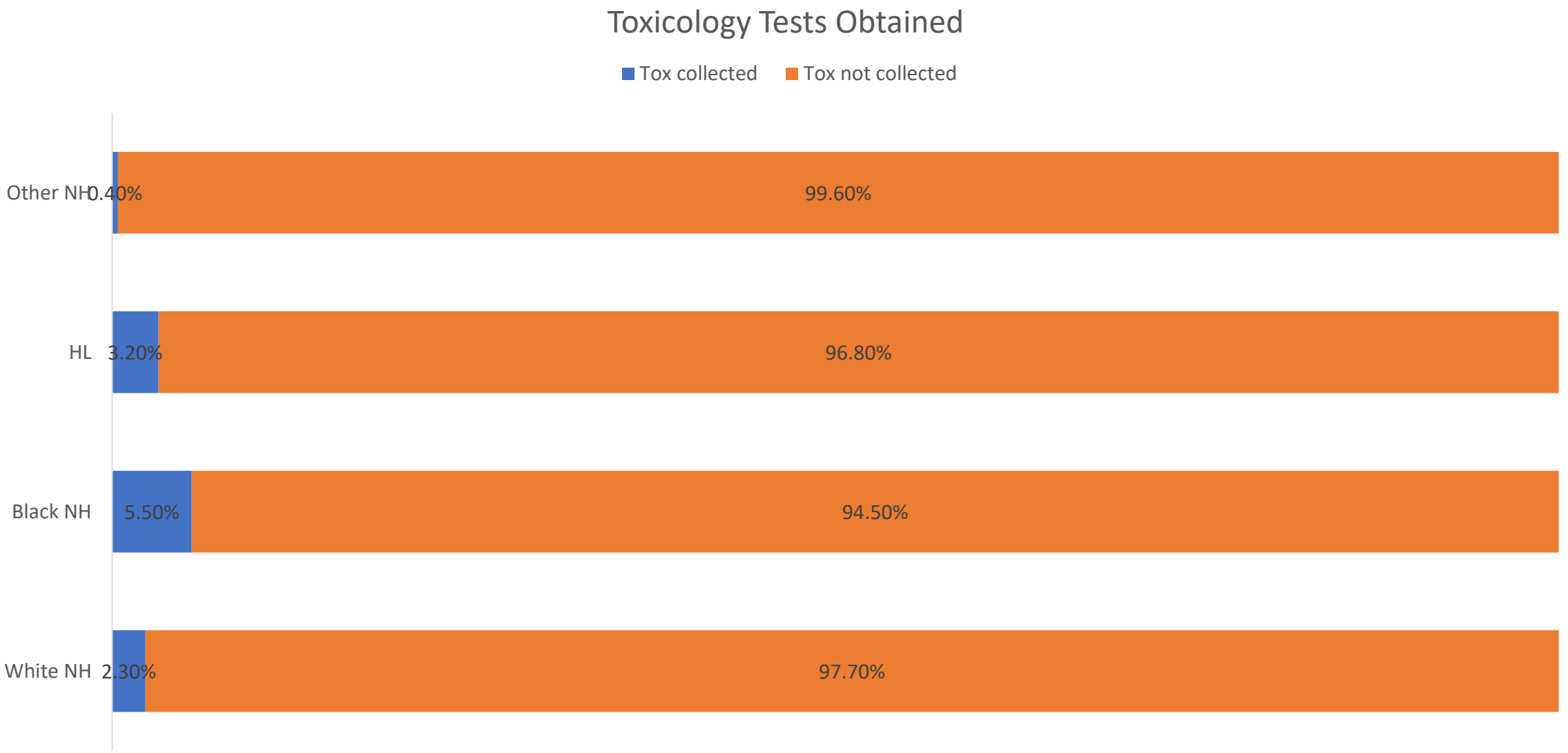

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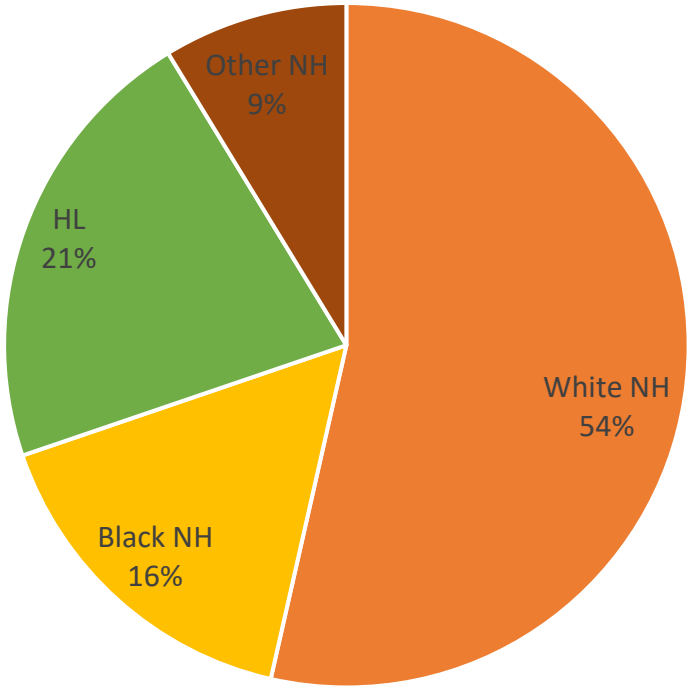
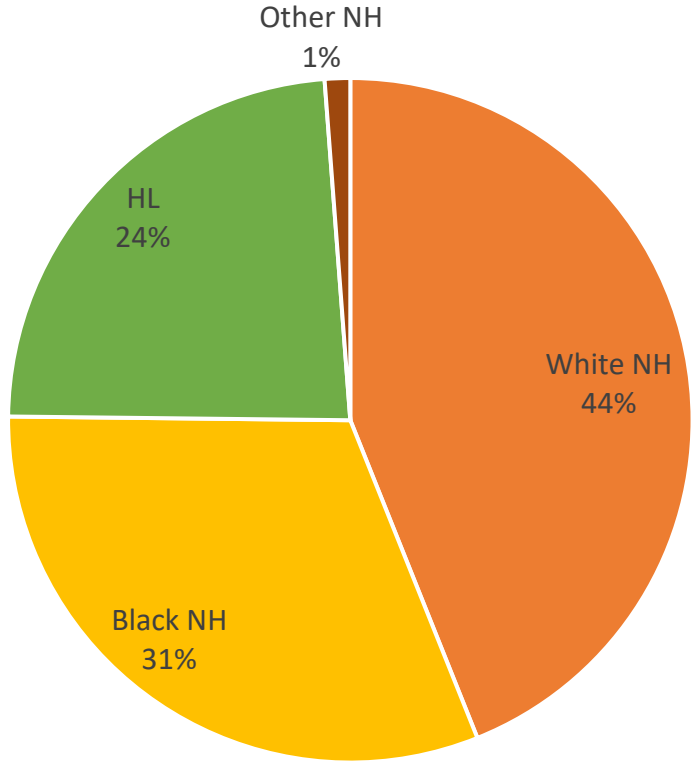
## Newborns by Race




## Toxicology Tests Collected by Race



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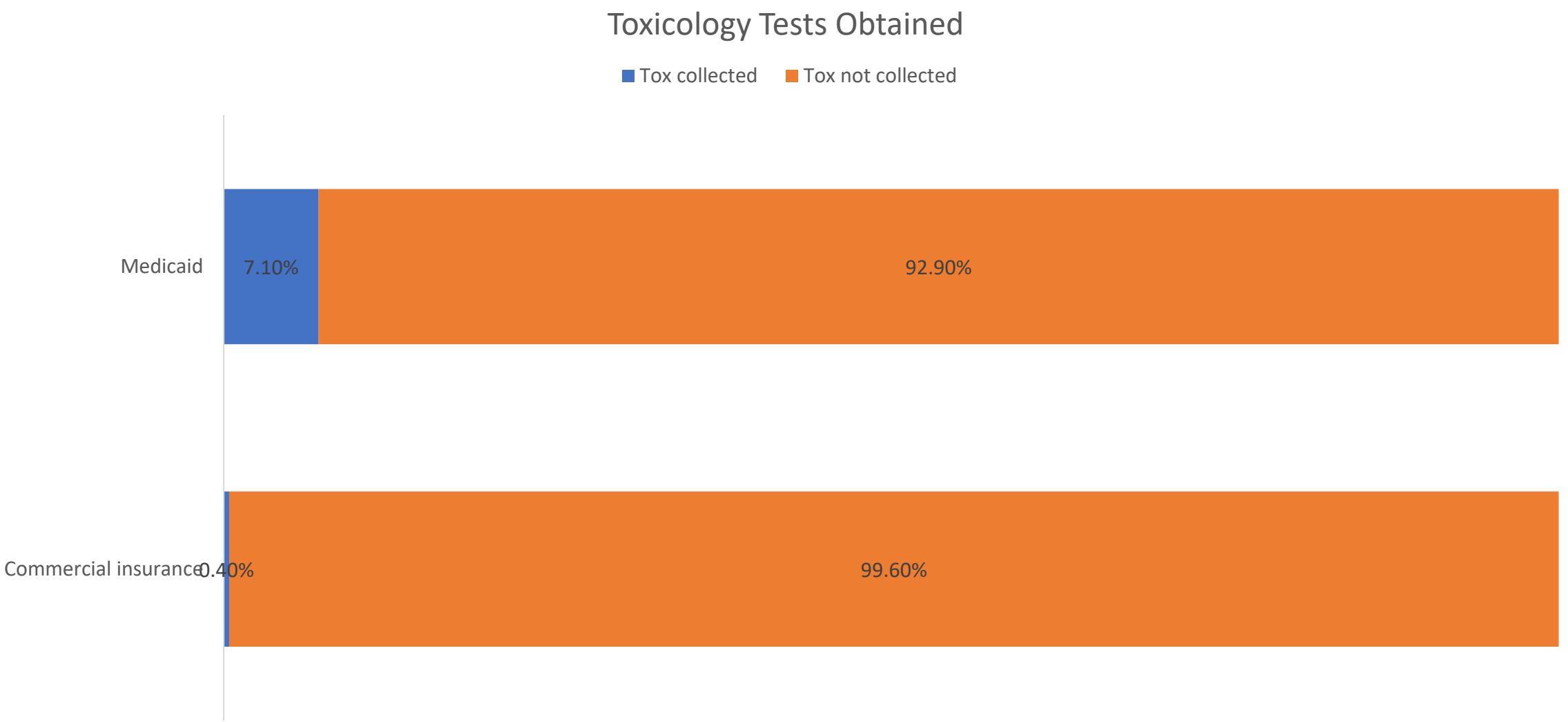

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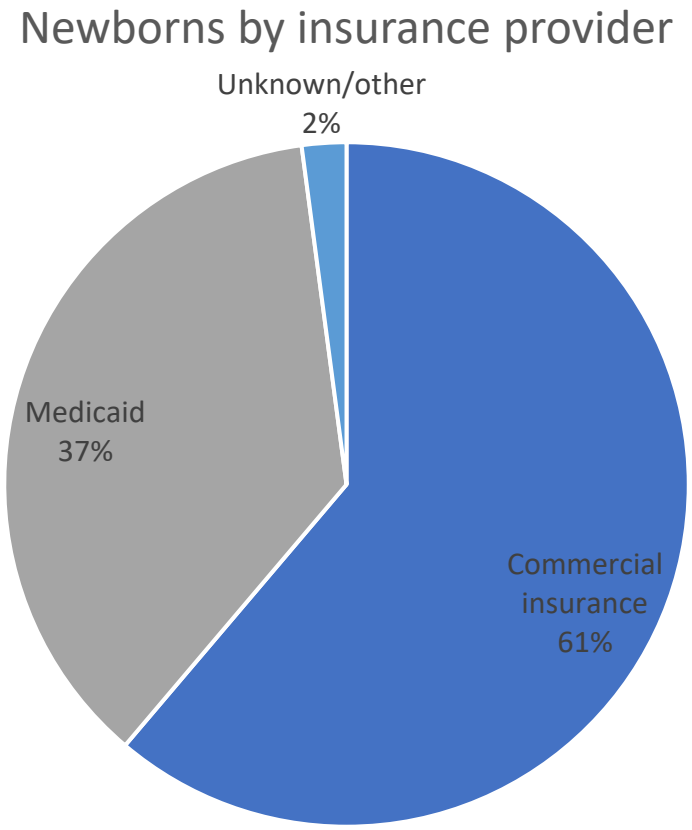


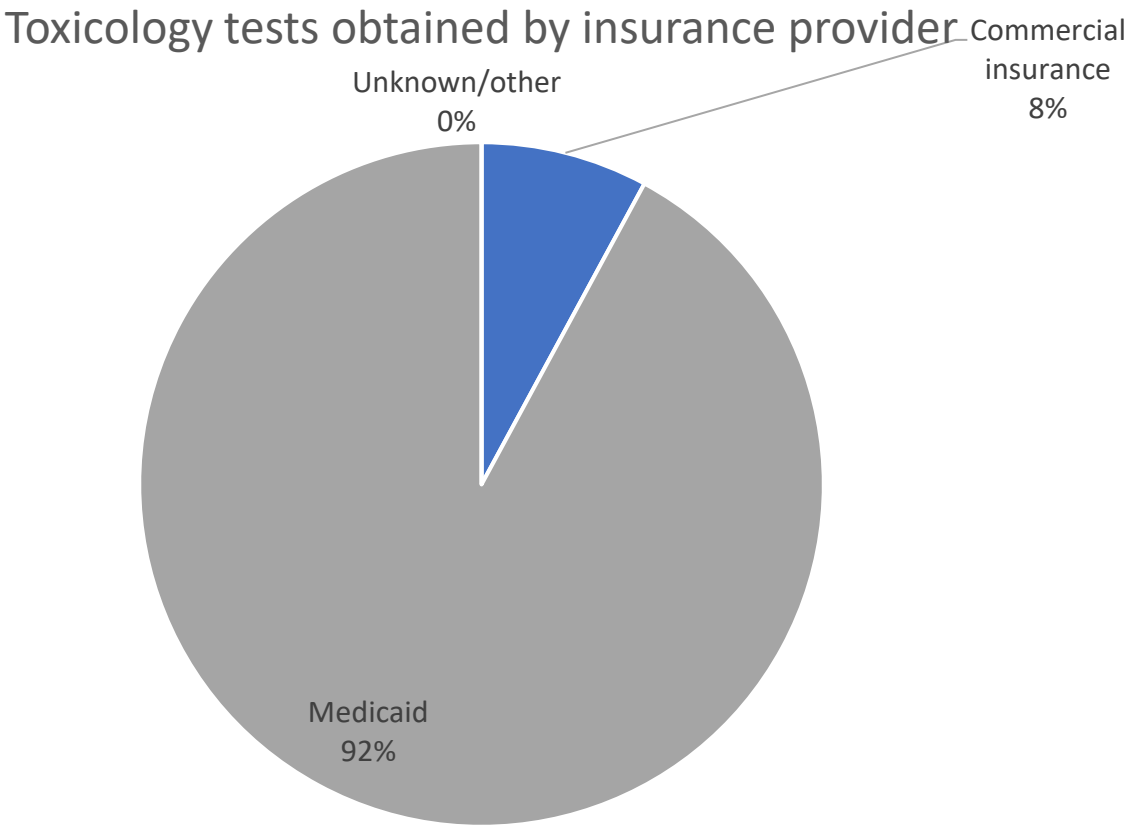

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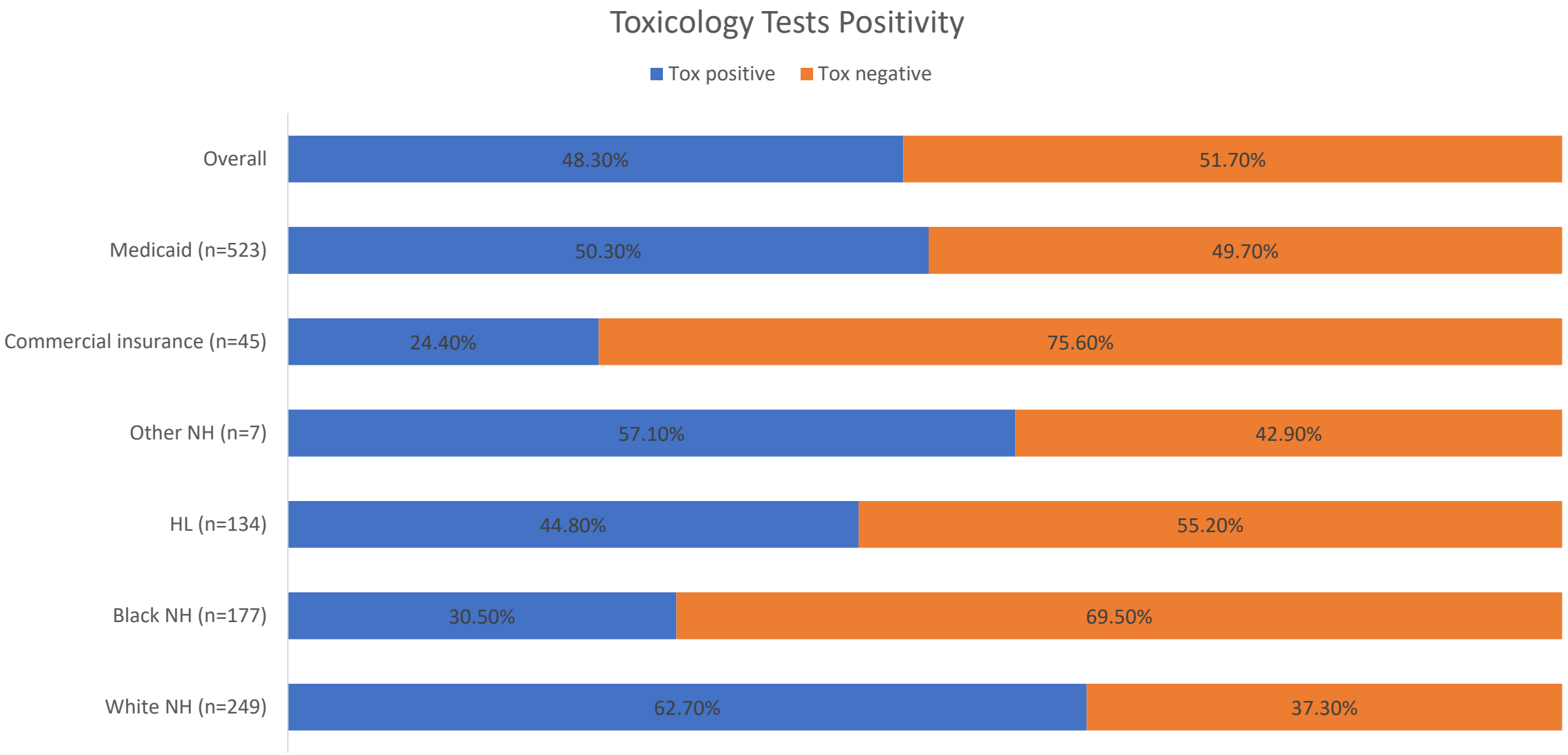
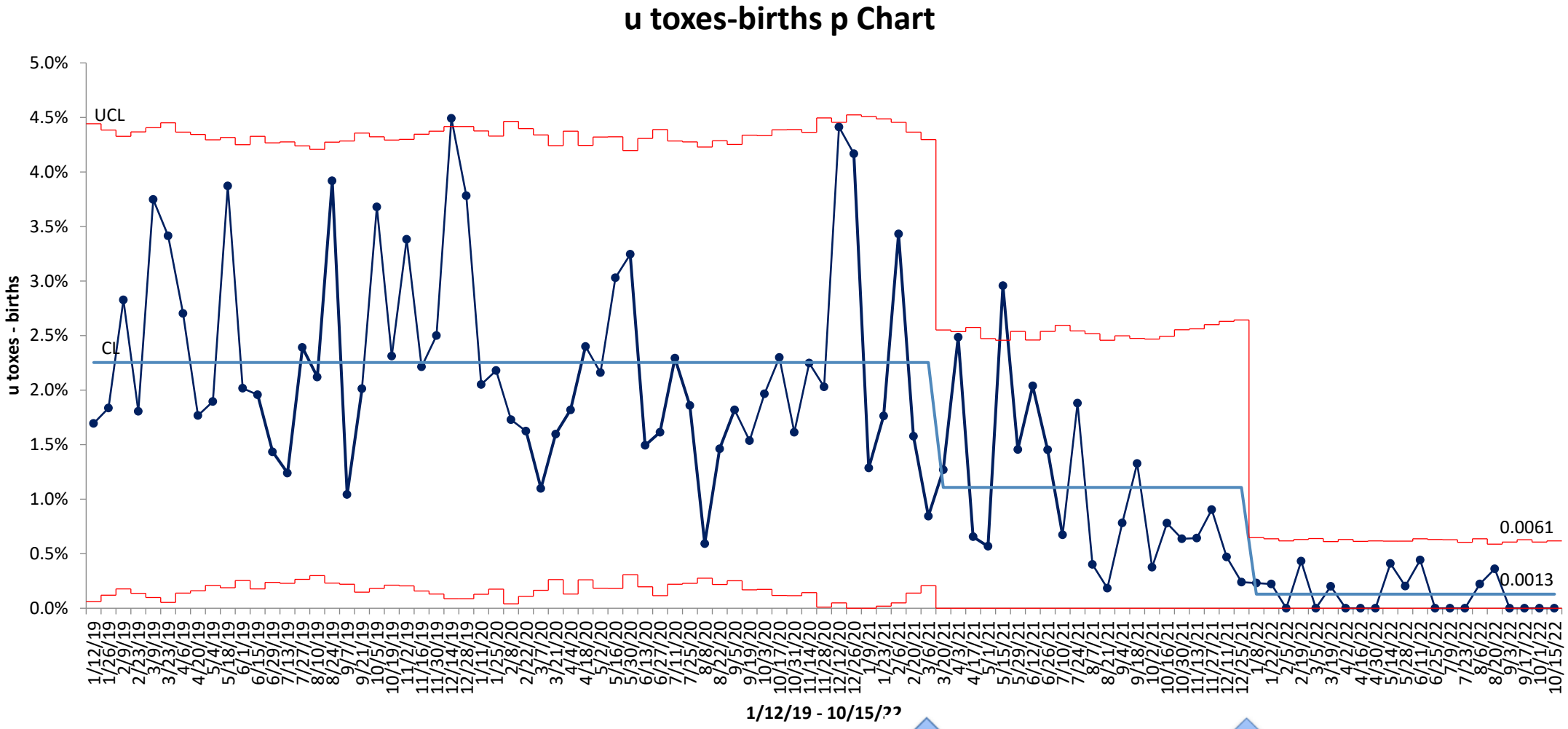


# Control chart




(A) Began work on project with conversations and coalition-building

(B) Protocol "live" on hospital intranet

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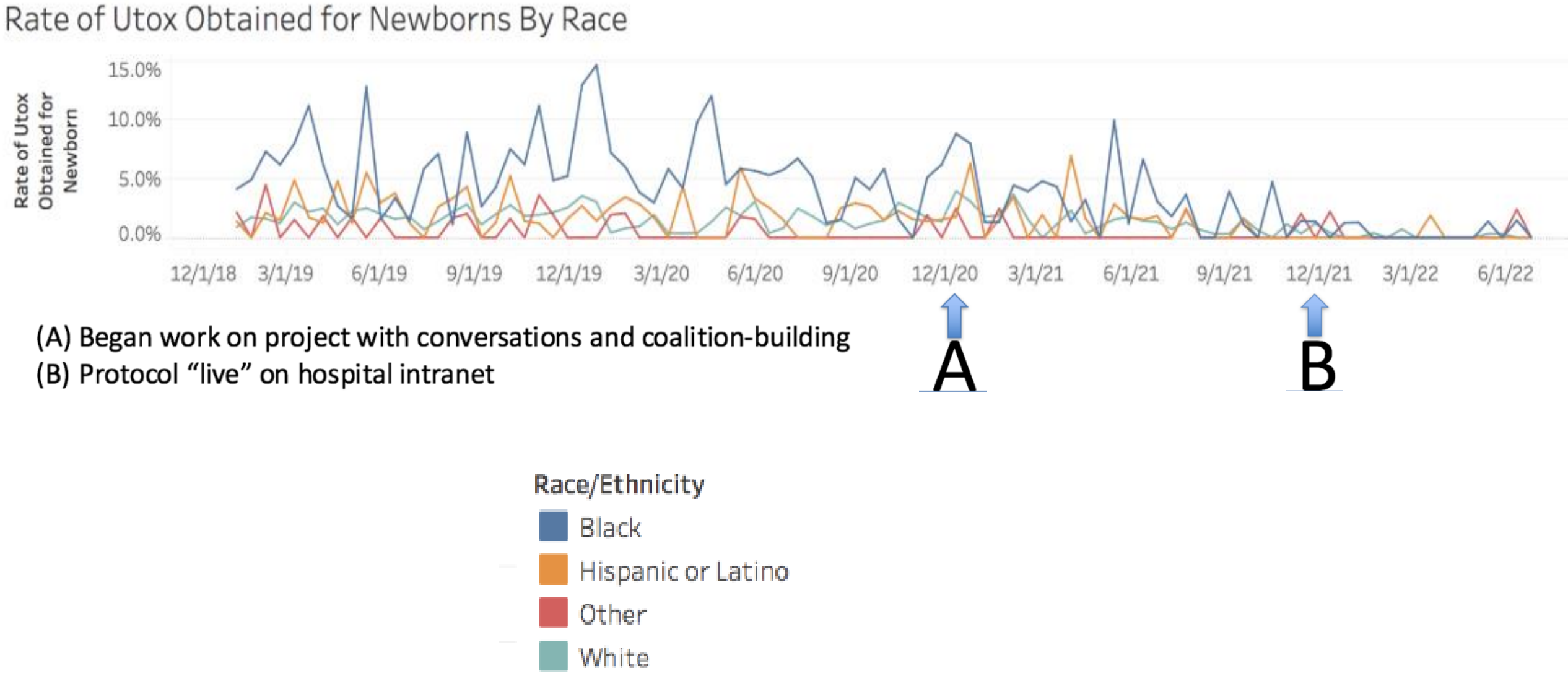


(A) Began work on project with conversations and coalition-building
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# After (1/1/2022-6/30/2022)



not for dissemination preliminary QI data

| | WNH | BNH | HL | ONH |
|---|---|---|---|---|
| **Tox obtained** | 3 | 3 | 1 | 0 |
| **Total newborns with available data** | 1441 | 484 | 716 | 238 |
| **Percentage (pre)** | 0.2% (2.3%) | 0.6% (5.5%) | 0.1% (3.2%) | 0.0% (0.4%) |

| | Commercial insurance | Medicaid |
|---|---|---|
| **Tox obtained** | 2 | 6 |
| **Total newborns with available data** | 1716 | 1125 |
| **Percentage (pre)** | 0.1% (0.4%) | 0.5% (7.1%) |

# Balancing measures

- Will newborns return to the hospital with untreated/uncontrolled withdrawal symptoms?

- Will children present with neglect in the setting of ongoing parental substance use?

- The underlying aspect of these questions is: “in situations where the newborn toxicology test would have been the only piece of information that led to a suspicion for and subsequent evaluation of prenatal substance use”
  - Rare
  - A failure of multiple systems that we are concurrently working to strengthen

CAPTA DATA SUMMARY | YALE NEW HAVEN HOSPITAL NETWORK | Reporting Period End: November 30, 2022

| | BRIDGEPORT % of hospital total | | GREENWICH % of hospital total | | LAWRENCE & MEMORIAL % of hospital total | | YALE NEW HAVEN % of hospital total | | NETWORK % of network total | | STATE % of state total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PRE N=228 | POST N=18^ | PRE N=9^ | POST N=3^ | PRE N=310 | POST N=93 | PRE N=609 | POST N=124 | PRE N=1156 | POST N=238 | PRE N=5657 | POST N=1677 |
| NUMBER OF CAPTA NOTIFICATIONS TO DCF | | | | | | | | | | | | |
| 2019 - *Partial Year beginning March 14* | 83 | - | 1 | - | 81 | - | 207 | - | 372 | - | 1610 | - |
| 2020 | 85 | - | 0 | - | 133 | - | 251 | - | 469 | - | 2044 | - |
| 2021 | 60 | - | 8 | - | 96 | - | 151 | - | 315 | - | 2003 | - |
| 2022 – *Partial Year ending November 30* | - | 18 | - | 3 | - | 93 | - | 124 | - | 238 | - | 1677 |

| CAPTA Outcomes | BRIDGEPORT % of hospital total | | GREENWICH % of hospital total | | LAWRENCE & MEMORIAL % of hospital total | | YALE NEW HAVEN % of hospital total | | NETWORK % of network total | | STATE % of state total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Family Care Plan | PRE N=228 | POST N=18^ | PRE N=9^ | POST N=3^ | PRE N=310 | POST N=93 | PRE N=609 | POST N=124 | PRE N=1156 | POST N=238 | PRE N=5657 | POST N=1677 |
| *No Family Care Plan* | 9.2 | 38.9 | 11.1 | 0 | 10.6 | 23.7** | 45.5 | 13.7*** | 28.7 | 19.3** | 32.4 | 27.5*** |
| *Yes, Developed by Reporter* | 65.4 | 22.2 | 77.8 | 66.7 | 27.4 | 26.9*** | 16.1 | 27.4*** | 29.3 | 27.3** | 41.2 | 42.8*** |
| *Yes, Verified by Reporter* | 25.4 | 38.9 | 11.1 | 33.3 | 61.9 | 49.5** | 38.4 | 58.9*** | 42.0 | 53.4** | 26.4 | 29.8*** |
| CPS Referral Triggered | 39.5 | 44.4 | 55.6 | 33.3 | 32.3 | 37.6*** | 72.4 | 34.7*** | 55.0 | 36.6*** | 47.4 | 41.0*** |

| Birthing Person & Family Data | BRIDGEPORT % of hospital total | | GREENWICH % of hospital total | | LAWRENCE & MEMORIAL % of hospital total | | YALE NEW HAVEN % of hospital total | | NETWORK % of network total | | STATE % of state total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PRE N=228 | POST N=18^ | PRE N=9^ | POST N=3^ | PRE N=310 | POST N=93 | PRE N=609 | POST N=124 | PRE N=1156 | POST N=238 | PRE N=5657 | POST N=1677 |
| Mean Age | 26.58 | 29.11 | 31.44 | 36.33 | 28.35 | 29.41 | 28.58 | 29.62 | 28.15 | 29.58 | 27.99 | 28.55 |
| Hispanic | 29.4 | 33.3 | 22.2 | 33.3 | 13.2 | 16.1 | 12.6 | 9.7 | 16.2 | 14.7 | 20.6 | 22.9 |
| Race^^ | n=189 | n=15 | n=6 | n=1 | n=272 | n=79 | n=453 | n=95 | n=920 | n=190 | n=4336 | n=1244 |
| *Black/African American Only* | 52.9 | 46.7 | 33.3 | 0 | 18.8 | 20.3 | 43.7 | 57.9 | 38.2 | 41.1 | 29.5 | 27.1 |
| *White Only* | 46.6 | 53.3 | 66.7 | 100 | 79.0 | 21.0 | 53.6 | 41.1 | 59.3 | 54.7 | 68.6 | 70.8 |
| *Multi/Other* | 0.5 | 0 | 0 | 0 | 3.7 | 8.9 | 2.6 | 1.1 | 2.5 | 4.2 | 1.9 | 2.1 |
| Mean Number of CPS Risks (scale 0-3) | 0.62 | 0.67 | 0.56 | 0.33 | 0.45 | 0.39 | 1.28 | 0.58 | 0.93 | 0.51 | 0.57 | 0.42 |
| *Child Tested Positive for Maternal Misuse#* | 17.5 | 0 | 22.2 | 0 | 7.4 | 1.1*** | 5.7 | 0.8*** | 8.7 | 0.8*** | 12.2 | 10.7 |
| *Current Maternal Substance Misuse* | 31.6 | 33.3 | 33.3 | 0 | 23.5 | 25.8 | 64.9 | 29.0*** | 47.0 | 27.7*** | 26.4 | 17.6*** |
| *Family Present, Suspect Abuse/Neglect* | 13.2 | 33.3 | 0 | 33.3 | 14.5 | 11.8 | 57.8 | 28.2*** | 36.9 | 22.3*** | 18.3 | 13.2*** |

| | BRIDGEPORT % of hospital total | | GREENWICH % of hospital total | | LAWRENCE & MEMORIAL % of hospital total | | YALE NEW HAVEN % of hospital total | | NETWORK % of network total | | STATE % of state total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | PRE N=228 | POST N=18^ | PRE N=9^ | POST N=3^ | PRE N=310 | POST N=93 | PRE N=609 | POST N=124 | PRE N=1156 | POST N=238 | PRE N=5657 | POST N=1677 |
| Child Tested for Substances | 61.8 | 0 | 44.4 | 33.3 | 44.8 | 5.4*** | 27.6 | 2.4*** | 39.1 | 3.8*** | 72.8 | 69.3** |
| *Meconium* | 0 | 0 | 0 | 0 | 1.3 | 0 | 0 | 0 | 0.3 | 0 | 43.4 | 49.1*** |
| *Urine* | 60.5 | 0 | 44.4 | 33.3 | 15.2 | 1.1*** | 26.6 | 2.4*** | 30.4 | 2.1*** | 60.6 | 58.3 |
| *Umbilical Cord* | 0 | 0 | 0 | 33.3 | 39.7 | 4.3*** | 0.2 | 0 | 10.7 | 2.1*** | 6.4 | 2.7*** |

| NEWBORN DATA CONTINUED | BRIDGEPORT % of hospital total | | GREENWICH % of hospital total | | LAWRENCE & MEMORIAL % of hospital total | | YALE NEW HAVEN % of hospital total | | NETWORK % of network total | | STATE % of state total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Substance Exposures Reported | PRE N=228 | POST N=18^ | PRE N=9^ | POST N=3^ | PRE N=310 | POST N=93 | PRE N=609 | POST N=124 | PRE N=1156 | POST N=238 | PRE N=5657 | POST N=1677 |
| *Alcohol* | 3.1 | 0 | 0 | 33.3 | 5.8 | 6.5 | 6.7 | 7.3 | 5.7 | 6.7 | 3.0 | 3.0 |
| *Buprenorphine* | 0.4 | 0 | 22.2 | 0 | 8.7 | 6.5 | 3.0 | 5.6 | 4.2 | 5.5 | 5.2 | 4.9 |
| *Cocaine* | 6.1 | 38.9 | 11.1 | 0 | 10.6 | 15.1 | 13.6 | 16.5 | 11.3 | 16.8* | 8.1 | 8.7 |
| *Marijuana* | 85.5 | 72.2 | 66.7 | 100 | 73.5 | 73.1 | 71.3 | 68.5 | 74.7 | 71.0 | 79.1 | 82.2** |
| *Methadone* | 10.5 | 16.7 | 11.1 | 0 | 17.1 | 11.8 | 14.4 | 22.6* | 14.4 | 17.6 | 8.8 | 8.6 |
| *Non-Rx Opiate* | 2.6 | 11.1 | 0 | 0 | 6.1 | 7.5 | 9.9 | 12.9 | 7.4 | 10.5 | 6.0 | 7.9** |
| *Other Illegal/Non-Rx Substance* | 5.3 | 5.6 | 11.1 | 0 | 4.8 | 11.8* | 5.4 | 7.3 | 5.3 | 8.8* | 4.3 | 4.2 |
| *PCP* | 1.8 | 11.1 | 0 | 0 | 0.6 | 0 | 4.4 | 1.6^ | 2.9 | 1.7 | 1.2 | 0.8 |
| *Rx Benzodiazepine* | 1.8 | 0 | 33.3 | 0 | 2.3 | 2.2 | 4.3 | 8.1 | 3.5 | 5.0 | 2.7 | 2.0 |
| *Rx Opiate* | 3.1 | 0 | 0 | 0 | 2.3 | 0 | 3.1 | 10.5 | 2.9 | 5.5* | 3.0 | 2.3 |
| *OTC Exposure* | 0 | 0 | 0 | 0 | 1.3 | 0 | 1.1 | 1.6^ | 1.0 | 0.8 | 0.3 | 0.2 |

# To summarize…

- Newborn toxicology testing in the setting of prenatal substance exposure is usually not necessary to provide optimal clinical care
- When it is clinically indicated, urine toxicology testing provides actionable clinical information
- Informed consent should be obtained before obtaining newborn toxicology testing in the vast majority of circumstances
- In enacting a practice guideline with these key messages, we did not see safety events occur as a result

- Please get in touch with questions, conversation, or information:
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