

Submitter name: Wade Berrettini
Submitter email: wadeb@penmedicine.upenn.edu

Neonatal Opioid Withdrawal Syndrome: Observations in a Health System

Raghu Metpally¹, Karena M Moran², Andrew E Weller³, Glenn A Doyle³, Richard C Crist³, Janet Robishaw⁴, Benjamin C. Reiner³, Thomas N Ferraro⁵, Vanessa Troiani^{6,7,8}, Wade H. Berrettini^{3,6}

¹Dept. of Molecular and Functional Genomics, Geisinger; ²Northeastern Pennsylvania Perinatal Quality Collaborative, Geisinger; ³Department of Psychiatry, Perelman School of Medicine, University of Pennsylvania; ⁴Charles E. Schmidt College of Medicine, Florida Atlantic University; ⁵Cooper Medical School, Rowan University; ⁶ Geisinger Clinic, Geisinger; ⁷Dept. of Imaging Science and Innovation, Geisinger; ⁸Neuroscience Institute, Geisinger

Background: Northeastern Pennsylvania has witnessed a 5-fold increase in opioid overdose deaths per 100,000 residents since 2010, and a parallel 5-fold increase in infants born with neonatal opioid withdrawal syndrome (NOWS). Signs of NOWS appear 18-72 hours after birth and include a persistent high-pitched cry, hyper-reactivity to environmental stimuli, gastrointestinal distress, sleeplessness, increased muscle tone, hyperreflexia, diaphoresis, fever, ineffective sucking motions, rhinorrhea, tachypnea and seizures.

Methods: We reviewed anonymized EHRs with NOWS ICD-10 code, P96.1.

Results: 672 women with OUD delivered infants at Geisinger from 1/1/2016 to 8/31/2018, representing **5%** of all live births at Geisinger during this time. 14% of pregnant women with OUD were in treatment at Geisinger at delivery. 45% of women with OUD attended their postpartum appointment (with a Geisinger obstetrician), compared to 72% of women without OUD. For Geisinger NOWS mother-infant dyads who had been seen at least one other time in the past 2 years, 473 pregnant women with OUD delivered 526 neonates between 11/2007-4/2019. These women had high rates of nicotine and other substance use disorders and major depressive disorder. 60-75 NOWS neonates were born at Geisinger annually since 2014, but the 2019 number may be ~ 90.

Conclusion: The majority of pregnant women with OUD do not seek treatment at Geisinger. They have high rates of other use disorders and mood disorders. Longitudinal studies of these infants must be done to understand the developmental cognitive and behavioral challenges which they face as they move through childhood into adolescence and young adulthood.