Escaping postnatal opioid exposure in infants with Neonatal Opioid Withdrawal Syndrome using the Eat, Sleep, Console (ESC) assessment tool

Lisa Chyi MD, Michael Kuzniewicz MD MPH

|  |  |
| --- | --- |
| Challenge | **Growing incidence coupled with prolonged hospital stays has led Neonatal Opioid Withdrawal Syndrome (NOWS) infants to utilize a disproportionate amount of hospital resources. The current Finnegan Neonatal Abstinence Scoring System (FNASS)used to guide NOWS management is a major driver of this length of stay.**  |
| Existing Evidence | The function-based Eat, Sleep, Console (ESC) assessment tool combined with a non-pharmacologic care bundle has been shown to decrease the percentage of NOWS patients requiring pharmacologic treatment and to shorten the length of stay (LOS) compared to historical cohorts managed by the FNASS. These studies were performed in inpatient Pediatric units which allowed optimization of a low-stimulation environment and parental rooming-in. It is unclear whether the ESC approach would have a similar impact in Kaiser Permanente Northern California where most hospitals do not have a pediatrics unit and NOWS infants requiring treatment are admitted to the high stimulation neonatal intensive care unit environment. Additionally, previous studies evaluated the ESC assessment tool as a component of a larger NOWS bundle of care change. The independent effect of the ESC versus FNASS assessment tool on NOWS outcomes has not been evaluated. |
| Target Population | Infants born at ≥ 35 weeks gestational age with in-utero opioid exposure  |
| Intervention or Exposure | Implementation of the ESC assessment tool.  |
| **Outcomes/Key Findings** | **Keeping all other aspects of the NOWS treatment protocol constant, the ESC assessment tool was not associated with decreased initiation of pharmacotherapy or shorter length of stay (overall nor among those that were treated pharmacologically).** The crude percentages of opioid-exposed infants that were treated pharmacologically were similar (FNASS 14.6% versus ESC 18%, P=0.47). Following adjustment for type of maternal opioid and additional maternal drug exposures, the odds of pharmacologic treatment were not significantly different for those managed with the ESC tool versus FNASS: aOR 0.85 (95% CI 0.34-2.1). Median length of stay with FNASS was 3.4 days versus 3.7 days with ESC (p=0.43). The adjusted hazard rate for discharge was 1.09 (95% CI 0.82-1.45). For those that were treated with opioid replacement therapy, the median length of treatment using FNASS (9 days) and ESC (10 days) were not significantly different, even after risk adjustment. Readmission or emergency department evaluation for NOWS related diagnoses were rare after discharge in both groups, FNASS (1.3%) and ESC (2%), P=0.65.Our study suggests that the assessment tool is likely not the key component driving decreased pharmacologic treatment and reduced length of stay. Using the FNASS, our baseline use of pharmacotherapy in opioid-exposed infants was 14.6%, similar to the 14-40% seen in other studies post implementation of the ESC assessment tool and maximization of non-pharmacologic measures. We theorize that our standardized non-pharmacologic and pharmacologic care had already reduced pharmacotherapy primarily to patients with severe NOWS at baseline. Infants with severe withdrawal may require pharmacotherapy regardless of the assessment tool used. The lower KP baseline pharmacotherapy rate may also be partially attributable to our primarily non-Medicaid population (51-53% commercial insurance) compared to previous publications (87-100% public insurance). Most of our mothers were in a treatment program or receiving chronic pain medications which may correlate with increased maternal involvement and subsequently more success in maximizing non-pharmacologic care.This study shows the importance of formally evaluating elements of quality improvement bundles. It can often be difficult to discern what elements of the improvement bundle is driving change and therefore make it hard to replicate results from other institutions.  |
| **Resulting Action/Change** | **Despite lack of improvement in the primary outcomes, the ESC assessment tool was found to be safe and easier to use for the nursing staff (3 elements versus 14 elements) which improved nursing workflow. As a result, we are currently preparing for regional launch of the ESC assessment tool.** |
| Additional Recommendations |  |
| Implementation Tools  | ESC RN training module, recorded physician webinar on ESC protocol, Health Connect ESC Flowsheet, ESC-based NOWS management protocol, updated parent handout, methodology to pull NOWS data electronically |
| Implementation Measurement | Initiation of pharmacotherapy, LOS, length of treatment (LOT) and Emergency Room visit/hospital readmission with ESC versus traditional FNASS assessment.  |
| References | Please see attached figures and tables  |

