Regional Neonatal Abstinence Syndrome Education Increases Provider Knowledge

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ABSTRACT – Neonatal Abstinence Syndrome Comprehensive Education and Needs Training (NASCENT) is a statewide, multi-stakeholder project created to respond to neonatal abstinence syndrome. The project demonstrated that a regional approach to education is an effective method to create awareness of the problem and knowledge of solutions. NASCENT demonstrated large improvements in both general and clinical knowledge across the three training program modules in the initial roll-out of NASCENT in north-central Connecticut. Eighty-three percent (83%) of providers who completed the evaluations (n = 1192) would change their practice. Eighty-four percent (84%) of providers indicated that there were risk management interventions that could be implemented in their practice. Eighty-seven percent (87.3%) indicated that the information presented was useful. Forty office practices trained 177 providers and staff, and 86% reported that they intended to use the information presented. The lack of time to use the information was the most frequently cited barrier (21%).

Background

In 2017, the Department of Health and Human Services (DHHS) declared a nationwide public health emergency with regard to the opioid crisis.1 On average, 130 Americans die every day from an opioid overdose.2 Approximately 68% of the more than 70,200 drug overdose deaths in 2017 involved an opioid.2 There has been an increase in overdose deaths and emergency department visits for overdoses nationally, with each increasing by approximately 30% from July 2016 through September 2017.3

In 2017, accidental drug overdoses in Connecticut resulted in 1038 deaths, up from 357 in 2012.4 More people died in Connecticut due to drug overdoses than car accidents or gunshot wounds combined.5 The drug overdose death rate increased 12.8% from 2016 – 2017.6 In 2016, Connecticut ranked eleventh among all states in the highest rate of overdoses, with 27.4 deaths per 100,000 people.7

There are many factors that can lead to the increased use of opioids. One factor is the increase in prescribing opioids. In the late 1990s, pharmaceutical companies reassured the medical community that patients would not become addicted to prescription opioid pain relievers, and health care providers began to prescribe them at greater rates.8 This subsequently led to widespread diversion and misuse of these medications before it became clear that these medications could indeed be highly addictive.8
Between 2007 and 2016, the opioid-related mortality ratio associated with pregnancy increased 34% (31.7 to 42.3). Pregnancy-associated mortality involving opioids more than doubled in the rate and the percentage of all pregnancy-associated deaths (4% to 10%). These increases were most pronounced for white women, despite their lower risk of all-cause and pregnancy-associated mortality compared with non-Hispanic black women. Several studies have emphasized the increasing use of prescription opioids among women of childbearing age and pregnant women, with 22% – 30% of women filling at least one prescription for an opioid analgesic during pregnancy. Primary care physicians prescribe the bulk of opioids. Engaging the medical specialties individually is critical for continued improvement in the safe and effective treatment of pain.

The rising prevalence of opioid use disorder (OUD) in pregnancy has led to a sharp increase in neonatal abstinence syndrome (NAS), a constellation of physiologic and neurobehavioral signs exhibited by newborns exposed to addictive prescription or illicit drugs in utero. Signs and symptoms most commonly occur 48 – 72 hours after birth. They include difficulty consoling, irritability, tremors, seizures, poor feeding, and low birth weight, among others. NAS occurred in 55% – 94% of newborns whose mothers were addicted to or treated with opioids while pregnant, most commonly in chronic users. The annual number of NAS hospitalizations in Connecticut has more than doubled in the past decade. The average length of hospital stay for infants with NAS is four times longer than that for all newborns (15.8 days vs 3.8 days) and median inpatient hospitalization cost for NAS is more than seven times higher than that for all newborns ($13,421 vs $1,862).

Introduction to CHREF’s NASCENT Project

To further assess the problem, in 2016, Connecticut Hospital Association’s 501(c)(3) affiliate, the Connecticut Healthcare Research and Education Foundation (CHREF), collaborated with the Connecticut Department of Mental Health and Addiction Services (DMHAS) and the Department of Children and Families (DCF), and collected data through a survey sent to nursing directors of perinatal services and neonatal physician directors in Connecticut hospitals. The survey contained questions to assess clinicians’ recognition of mothers using harmful substances at the time of delivery, their mechanism of diagnosis such as urinalyses or cord blood samples, and their assessment of infants at risk for exposure to opioids or alcohol. The survey identified variability in recognition and treatment of substance use disorder (SUD) at birthing hospitals, and a number of responses indicated no SUD identification was occurring. The survey results led to a coalition of individuals asking how this emerging problem of NAS, associated with SUD, could be mitigated while more hospitals created standardized responses. One method identified was to focus on the mothers with SUD, by preventing the initial exposure to medications associated with SUD through education of the prescribing providers. Other methods included collaboration with DCF on regulations for infants with exposures to harmful substances, collaboration with the Department of Public Health (DPH) on prescribing guidelines, and collaboration with the Department of Consumer Protection on the prescription drug monitoring program (PDMP).

After recognizing the needs common to managing SUD and NAS, CHREF created the NASCENT project to address the role opioid prescribing plays in SUD. NASCENT is a statewide, multi-stakeholder project created to respond to NAS, representing sectors across the health care delivery system and spearheaded by CHREF. The purpose of this initiative was to demonstrate that a regional approach to education is an effective method for creating awareness of the problem, increasing best practice utilization for opioid prescribing, and identifying and treating women of childbearing age with SUD. The project was funded by grants from the Hartford Foundation for Public Giving, Coverys, Chelsea Groton Bank, and Pfizer.

A key goal of the project was to train providers in the early recognition of OUD and treatment across hospitals, physician practices, and Federally Qualified Health Centers (FQHCs). The education initiative was deployed on a large scale, and delivered in methods utilized by clinicians caring for women of childbearing age at risk for OUD. The project targeted medical providers including internists, family practitioners, obstetricians, pediatricians, orthopedic surgeons, neurologists, emergency department practitioners, physician assistants, and nurse practitioners, among others. Nurses, physical therapists, imaging technicians, office staff, and others who interact with patients at risk were also included in the cohort.

NASCENT Composition and Advisory Board

The project utilized an Advisory Board, with state and local experts; patients, to integrate the voice of the community; and multimodal education for the providers and clinical staff. The NASCENT Advisory Board, comprising 25 interdisciplinary members, provided evidence-based collaboration and data analysis as well as accountability and direction for project
activities. CHREF partnered with the Connecticut State Medical Society (CSMS), the Child Health and Development Institute (CHDI), Med-IQ, the Curtis D. Robinson Center for Health Equity, the Connecticut Chapter of the March of Dimes, the Connecticut Perinatal Quality Collaborative, the DPH, DCF, and the DMHAS, as well as hospitals, FQHCs, and physician office practices across the Hartford region. These working relationships were integral to the success of the project and representatives from each of these groups served on the Advisory Board.

Focus Group

To better inform the Advisory Board’s direction for the NASCENT project, the Curtis D. Robinson Center for Health Equity conducted a focus group, comprising ten women, to gather community input as part of the learning needs assessment. The women who volunteered to participate were from a group of women with recovering SUD who were working with the Curtis Robinson Center at the time. They were given $50.00 gift certificates for their time. They remained anonymous to the Advisory Board, as their comments were aggregated. Highlights from the community’s discussion were incorporated into the NAS education. The themes included identifying methods to prioritize helping those who self-identify as addicts, support babies and mothers after delivery of a baby with NAS, training clinicians and staff in cultural competence and acknowledging bias, increasing the use of nonopioid options such as nonopioid prescriptions, training a liaison in the office to screen patients in a cultural context, recognizing high-risk populations, and increasing the amount of education on birth control.

Two women from the focus group volunteered to attend an Advisory Board meeting and told personal stories of their struggles with OUD, describing their experiences and noting how they felt stigmatized by clinical staff. They explained that bias toward women with OUD caused them not to seek treatment. The communication of these experiences resulted in the inclusion of trauma-informed care (TIC) in the NAS education. TIC is an approach to care delivery that “includes the impact of trauma, that emphasizes physical, psychological, and emotional safety for both providers and survivors, and that creates opportunities for survivors to rebuild a sense of control and empowerment.” The seminal study on the relationship between trauma and SUD showed 55% to 99% of women in substance use treatment report a history of trauma, with the abuse most commonly having occurred in childhood, compared to 38% to 51% in the general population.

Education

Education was provided through on-line and in-person modalities. CHREF partnered with Med-IQ to provide optional online training for providers at organizations across Hartford County. Med-IQ is a risk, quality, and safety education company focused on risk reduction for providers and health care organizations. Med-IQ provided an on-line education program with tracking capabilities and continuing education credits to providers and nurses. The training met some of the licensing requirements for continuing medical education (CME) in Connecticut. The content for the on-line web-based modules included two topics, NAS and Multi-Modal Analgesia and Alternatives to Opioids (MMA); the content of each was vetted and approved by the NASCENT Advisory Board. On-line training was available to providers treating pregnant women and also to providers who might be prescribing opioids to young women because of injuries, dental pain, or musculoskeletal pain. The intent of the training was to discourage providers from relying on opioids as a modality for pain relief, thus eliminating the antecedent factors for eventual SUD.

The NAS webinar included an overview of NAS and the growing magnitude of the problem. The module also introduced a technique to treat NAS called Eat, Sleep, Console, a novel approach to neonatal assessment developed by a pediatrician at Yale New Haven Hospital, focused on nonpharmacologic therapy and rooming-in, effectively decreasing length of stay and hospital costs. Case studies were utilized to demonstrate approaches that take patient experiences, the impact of bias, and the importance of the mother-baby dyad (eg, The Snuggle ME Project). The module included how to utilize a trauma-informed approach because there is a high correlation between early trauma and SUD.

There were three variants of the MMA web module based on specific practice areas: inpatient, outpatient, and behavioral health. Suggestions in the module included: checking the PDMP to determine the patient’s prior use or misuse of narcotics before writing the prescription; inquiring about past personal and family history regarding substance misuse (eg, using the Screening, Brief Intervention, and Referral to Treatment (SBIRT) Tool); and conducting and documenting a detailed informed consent discussion with the patient, advising of the benefits and risks associated with opioid use, and reiterating the safety and efficacy of other pain medications and nonpharmacological modalities.
Academic Detailing

A key component of the NASCENT project included outreach to physician office practices and FQHCs to support them in adoption of the Centers for Disease Control and Prevention's (CDC) 2016 Guidelines for Prescribing Opioids for Chronic Pain.\textsuperscript{21} The Guidelines include 12 recommendations that apply to initial prescribing and ongoing prescriptions for opioids, including nonpharmacological approaches to pain management, appropriate dosing and multi-pharmacy use, and practice processes for responsible prescribing. The Advisory Board selected academic detailing as the optimal approach for accelerating the implementation of the CDC Guidelines. Academic detailing includes visits to practices and FQHCs with targeted and practical messages\textsuperscript{22} and has shown positive outcomes in supporting practice change.\textsuperscript{23} CHREF contracted with CHDI, an organization that has a long history of using academic detailing to bring about practice change in pediatrics.\textsuperscript{24} CHDI commissioned a draft educational module for physician office practices and FQHCs that addressed best practices in opioid prescribing. An expert in pain management from the University of Connecticut developed the draft presentation, which was reviewed by the Advisory Board and refined for presentation.

The primary learning objectives for the academic detailing were to: describe the current epidemic and factors contributing to the incidence of opioid misuse, addiction, and death; examine recent recommendations for prescribing opioids and safeguards to identify and mitigate opioid-related risks; and evaluate strategies that can be used to monitor routinely and reduce opioid-related risks.

CHREF contracted with a physician, board certified in obstetrics and gynecology, to provide the training. In-person education was delivered to nearly 200 providers and staff from 40 multidisciplinary practices throughout Hartford County. Specialties receiving training included primary care, family medicine, pediatrics, women’s health, orthopedics, psychiatry, dentistry, and oncology, and multispecialty practices such as FQHCs.

Results of On-line Education

This article only reports on the outcomes measured in the initial implementation in north-central Connecticut. For the web-based learning modules, 2,416 providers had access to the education, and 1,535 hospital-based providers at 10 different health care organizations participated in the continuing medical education programs. Participants took an eight question pre- and post-test that was both knowledge and case-based for the MMA module. Of 1,535 total providers, 1,192 providers completed the evaluations, a 77.6% completion rate. There were 343 providers who did not complete an evaluation after viewing the education.

The evaluations administered at the end of each modality directly addressed a providers’ intended practice change. The data received indicated that 83% of providers who completed the evaluations (n = 1,192) would change their practice somewhat, mostly, or completely as a result of what they learned. Eighty-four percent (84%) of providers indicated that there were risk management interventions that could be implemented in their practice that would mitigate some of the exposures outlined in the education.

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<td>Are there risk management interventions that could be implemented in your practice that would mitigate some of the exposures outlined in the presentation?</td>
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percent (80%) of providers found the information presented relevant to their practice, with 87.3% indicating that the information presented was useful. Combined evaluation results from both modules are shown in Tables 1 and 2.

The pre- and post-test data indicated a 21% knowledge increase on the topic of NAS. Despite a high initial pre-test score of 83% on MMA, the education still resulted in a 7% increase in scores when compared to the post-test. Results from each of the modules are shown in Figure 1.

A total of 1535 educational activities were completed by providers across the state of Connecticut. Feedback from the online activities was very positive and indicated that providers plan on making changes in their practice as a result of the risk management strategies presented in the education.

Participant’s comments on the MMA educational activity included expanding the range of affordable nonopioid alternatives to optimize pain control, educating women regarding the risks of opioid use and problematic combinations of medications, and assessing women regarding medication use as well as review of the Connecticut PDMP.

Participant’s comments on the NAS educational activity included avoiding being judgmental of mothers with SUD and being more vigilant with opioids prescribed to women of childbearing age, supporting mothers cohabiting with their infants with NAS, and considering a reliable contraceptive regimen for women of childbearing age who are being prescribed opioids.

Results Practice Education

The effectiveness of the academic detailing component was evaluated in terms of gains in attendees’ knowledge and responses to feedback surveys distributed with each presentation. Pre- and post-tests were developed to assess knowledge gained, and the feedback surveys were based on the standardized forms used by CHDI since 2006.25

From March 1, 2018 through April 30, 2018, 40 office practices received the opioid prescribing education, and engaged in discussion with 177 providers. All attendees passing the post-test received one AMA PRA Category 1 Credit™ for attending the presentation.

A significant change in knowledge post-test was seen with practitioners originally underestimating the percent of people acquiring pain medication from a friend or relative. Another area of improvement was seen with an increase in recognizing best practice strategies when prescribing opioids for chronic pain.

Change in performance or practice was evidenced by 85% of the participants reporting that the information was useful and 86% reported that they intended to use the information presented. The lack of time to use the information was the most frequently cited barrier (21%).

The Advisory Board added two questions to assess the extent to which the presentation met attendee expectations and if there was any additional assistance the practice needed for opioid prescribing. One hundred attendees responded to the question about the extent to which the presentation met their expectations, with 48 reporting excellent, 40 reporting good, and 12 reporting satisfactory. Eighteen attendees provided open-ended comments in response to the question about additional support. Seven of these comments pertained to helping patients who were already addicted to opioids. One respondent requested help using the state monitoring system, and other comments were positive feedback regarding the training.

Additionally, nearly 250 people attended two conferences held at the Connecticut Hospital Association in 2017 and 2018. The NAS Conference, held in November 2017, included discussion of the role of opiates in postdelivery pain relief. A conference in March 2018 included presentations on the history of the opioid epidemic in Connecticut and options for access to treatment, practical hospital and community strategies, perinatal opioid use, and social connectedness in the context of recovery.

Sustainability and Next Steps

NASCENT has been one approach to decreasing provider prescriptions for opioids, but there have been other approaches used concurrently. The CHANGE the SCRIPT campaign was developed to increase awareness among prescribers in Connecticut and knowledge about the Connecticut Prescription Monitoring and Reporting System (CPMRS). The CPMRS is a web-based tool that provides a complete picture of a patient’s controlled substance use, including prescriptions by other providers. CPMRS is used to improve quality of patient care and reduce prescription misuse, addiction, and overdose. Opioid prescriptions have decreased in Connecticut from 2,602,050 in 2014 to 2,161,959 in 2017.

The Connecticut Perinatal Quality Collaborative has been working to decrease the risk of opioid dependency in reproductive-age women and improve the care of infants with NAS by educating hospitals on the Eat, Sleep, Console approach. Goals of the initiative are to increase the percentage of mothers with opioid-related SUD who receive a prenatal consult, increase...
the percentage of infants rooming-in with their mothers, and increase the percentage of infants who receive breast milk. For mothers on medication-assisted therapy, this approach has been shown to decrease the percentage of newborns who receive morphine, decrease length of stay, and decrease readmission rates.14

NASCENT has since spread to other sites in Connecticut, including Southeastern Connecticut. The Community Foundation for Greater New Haven is funding implementation of the NASCENT Project in the greater New Haven area. Clinicians will be educated regarding opioid prescribing and MMA online and in-person. In addition, women will be educated about how adverse childhood experiences result in increased risks for SUD. Data sharing and analysis will identify areas in need in Greater New Haven for women to participate in focus groups. Information learned from the focus groups will be incorporated into the learning.

CSMS communicated the importance of provider continuing medical education, public awareness to increase discussion on the risks and benefits of chronic opioid therapy, and using concurrent contraception to reduce unintended fetal exposure to the drugs.26 What seems to be clear from the collective results is the need to continue this level of inter-professional training and collaboration among partners. Moreover, continuing medical education is ready to move from broad-based information to more specific, targeted clinical interventions (eg, withdrawal from opioids). Provider feedback and the outcome measures collected to date demonstrate: education on the use of validated SUD screening is an effective tool that could be deployed to greater benefit for all obstetric patients; collaborative efforts are effective for reaching providers, patients, and families; and, increased coverage supporting SUD screening could benefit a larger number of patients and potentially drive down the incidence of NAS.

Discussion

There was improvement in both general (eg, extent of problem) and clinical knowledge (eg, contraindicated medications) across the three training program modules. Changes in practice were measured by intended use of information presented for both the web-based modules and academic detailing. From an educational perspective, identifying desired changes in relation to the learning objectives would have added value to demonstrating impact, rather than solely relying on generic reporting of intended behavior change. The NAS web-based module had the greatest impact on participant medical knowledge, which was the training specific to the expressed purpose of the NASCENT Advisory Board.

The community focus group conducted as part of the learning needs assessment indicated the importance of cultural competency training for health care providers and the importance of supporting mothers and infants with NAS. Some of the recommendations made by the community were aligned with participants’ comments to improve the learning content. For example, seven of the participant comments pertained to helping patients who were diagnosed with SUD and the community input recommended prioritizing help for those who self-identify as addicted to opioids.

In summary, the NASCENT project has effectively demonstrated that a regional approach to education is an effective method for creating awareness and increasing best practice utilization for opioid prescribing. The education and awareness raised among Hartford County and continuing in Southeastern Connecticut and New Haven for providers in physician office practices, FQHCs, and hospitals, is helping providers to better identify and treat women of childbearing age with opioid use disorder.

REFERENCES


