

First Do No Harm

Quality and Patient Safety Division, Massachusetts Board of Registration in Medicine

Message from QPSD Leadership

Julian N. Robinson, MD

Chair, Massachusetts Board of Registration in Medicine (BORIM)

Chair, BORIM Quality & Patient Safety Committee

Dear Colleagues,

It is difficult to believe that nearly two years have passed since Massachusetts was faced with the first wave of the pandemic. The challenges and losses have been tremendous. Despite this, we have persevered. Physicians, nurses, and other healthcare clinicians have cared for the patients of the Commonwealth selflessly for many months. Together we have moved forward with new therapies and treatments to manage the illnesses caused by Covid 19 and with the administration of vaccinations. As of January 31, 2022, 95% of Massachusetts residents have at least one dose of the COVID-19 vaccine and more than 75% are fully vaccinated.¹ Massachusetts currently ranks second in the nation for persons with 1+ doses administered per capita and currently is first for persons with 1+ doses per capita amongst states with five million people or more.² With the recent emergence of a new Covid 19 variant of concern, vaccination continues to be a safe and effective method of reducing the risk of getting and spreading the virus that causes COVID-19. Evidence is emerging that people are better protected by being fully vaccinated as compared with having a previous infection.³

In this issue, we focus on maternal and pediatric health. Approximately 700 women die each year in the United States due to pregnancy or delivery complications. Two thirds are preventable with the leading causes of death being cardiovascular conditions and maternal hemorrhage.⁴ Ten percent of all adverse events reported to the Quality and Patient Safety Division (QPSD) from 2016 through 2020 were obstetrical- related events. Thirty percent of those reported events involved maternal hemorrhage. We are fortunate to have Quality and Patient Safety Committee member, Dr. Sarah Rae Easter, provide information on maternal levels of care. Dr. Easter is the former Chair of the Levels of Maternal Care Taskforce sponsored by the Perinatal Neonatal Quality Improvement Network (PNQIN) of Massachusetts, the Betsy Lehman Center for Patient Safety, the Massachusetts Department of Public Health, and the Centers for Disease Control and Prevention. In addition, several hospitals share information regarding performance improvement initiatives involving maternal hemorrhage, enhanced recovery after cesarean section, neonatal abstinence syndrome, pediatric behavioral health, and equity in healthcare for maternal patients.

Finally, there have been several changes to the Board's Quality and Patient Safety Committee. Dr. Bismarck Cadet, from Winchester Hospital, and Dr. Meghna Trivedi, from UMass Memorial Medical Center, joined us last spring. Dr. Sarah Rae Easter, from Brigham and Women's Hospital, Dr. Booker T. Bush, from Baystate Medical Center; and Ms. Audrey Bosse, Patient Advocate, from Newton Wellesley Hospital, also joined us last fall. The committee continues to be a valuable resource to the QPSD by providing consultation, contributing to the QPSD newsletters, participating in educational workshops and conferences, and participating in meetings with healthcare facilities to learn more about their Patient Care Assessment (PCA) programs.

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I am truly proud of the work that has been accomplished by the committee and I thank them all for their support, hard work and expertise – it is a great group of dedicated individuals.

Best,

Julian N. Robinson, MD

¹ Massachusetts Department of Public Health. COVID-19 Vaccination Dashboard. 2021. Available at: <https://www.mass.gov/info-details/massachusetts-covid-19-vaccination-data-and-updates>. Accessed January 31, 2022.

² Massachusetts Department of Public Health. COVID-19 Vaccination Dashboard. 2021. Available at: [download \(mass.gov\)](https://www.mass.gov/info-details/massachusetts-covid-19-vaccination-data-and-updates). Accessed January 31, 2022.

³ Cavanaugh AM, Spicer KB, Thoroughman D, Glick C, Winter K. Reduced Risk of Reinfection with SARS-CoV-2 After COVID-19 Vaccination — Kentucky, May–June 2021. MMWR Morb Mortal Wkly Rep 2021;70:1081-1083.

[Reduced Risk of Reinfection with SARS-CoV-2 After COVID-19 Vaccination — Kentucky, May–June 2021 | MMWR \(cdc.gov\)](https://www.cdc.gov/mmwr/preview/mmwrhtml/mm7010a1.htm)

⁴ Centers for Disease Control and Prevention. Severe maternal morbidity in the United States. 2020. Available at: <https://www.cdc.gov/reproductivehealth/maternal-mortality/erase-mm/mmr-data-brief.html>. Accessed November 4, 2021.

This newsletter is issued by the Board of Registration in Medicine (BORIM), Division of Quality and Patient Safety (QPSD). The newsletter allows BORIM to share the practices and experiences of the healthcare clinicians and facilities that report to the Board. It does not necessarily include a comprehensive review of literature. Publication of this newsletter does not constitute an endorsement by the BORIM of any practices described in the newsletter and none should be inferred.

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Levels of Maternal Care

Levels of Maternal Care Task Force

Sarah Rae Easter, MD

Perinatal Neonatal Quality Improvement Network of Massachusetts

The Fall 2019 QPSD newsletter introduced a new quality-improvement focused initiative for hospitals providing obstetrical care in Massachusetts. This initiative, led by the Perinatal Neonatal Quality Improvement Network of Massachusetts (PNQIN), assembled a multidisciplinary task force of clinicians, public health enthusiasts, and patients to explore the [concept of Levels of Maternal Care \(LoMC\) in our state](#). The LoMC concept relies on collaboration between hospitals within a regional care network to ensure pregnant people have equitable access to delivery centers that appropriately address their level of risk and optimize their birth experience. The task force agreed that a better understanding of the resources available in our state was a requisite first step to achieving this goal and chose to use the [Centers for Disease Control and Prevention's Levels of Care Assessment Tool \(LOCATe\)](#) to meet this need.

The [Betsy Lehman Center for Patient Safety](#) supported the administration of CDC's LOCATe survey to the 40 hospitals providing obstetric services in Massachusetts in the spring of 2021. The LOCATe survey was completed by 100% of hospitals in our state and deidentified responses were analyzed by the team at the CDC. In the fall of 2021, The Betsy Lehman Center and PNQIN hosted the last of three [webinars outlining the Levels of Maternal Care](#) framework and providing a global overview of the results of the LOCATe survey in Massachusetts. Just a few weeks ago participating centers received a detailed summary of their hospital's LOCATe results. These confidential reports provided a global overview of maternal services and focused on aligning a hospital's self-assessed level of care with the level of care suggested by LOCATe. PNQIN is now offering hospitals and their providers voluntary follow up sessions to further explore opportunities to optimize equitable access to risk-appropriate obstetric care for their patients and their families.

For more information about this work or collaborating with PNQIN on maternal health or health equity quality improvement initiatives, please contact the task force leader, Sarah Rae Easter, at seaster@pnqinma.org.

Boston Children's Hospital Pediatric Behavioral Health During Covid 19

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The COVID-19 pandemic significantly disrupted health care systems and has led us to tackle many challenges and reshape the way we provide care. One of the most significant challenges that has developed in connection with the pandemic has been the worsening of a pre-existing pediatric mental health crisis. Prior to the pandemic, there was a progressive increase in emergency department (ED) lengths of stay for pediatric patients in need of higher levels of psychiatric care at inpatient or community based acute treatment programs, leading to a phenomenon known as "boarding". Since the onset of the pandemic, children and adolescents have been presenting to hospitals for psychiatric emergencies in record numbers and the volume of patients boarding for psychiatric higher lengths of care, as well as average wait times, have inflated exponentially at many hospitals locally and nationally.

Boston Children's Hospital (Boston Children's) has been working on a number of clinical and operational approaches to address some of the problems that arise secondary to long waits for psychiatric placement. Patients who are in the ED are often boarding for several days before transfer to a psychiatric treatment program or to an inpatient medical/surgical unit for ongoing boarding. In the early phases of the pandemic when resources were redirected to address the immediate patient care needs, many patients boarding for higher levels of psychiatric care were stuck in their ED room with limited opportunities for out of room activities. Now, Boston Children's staff offers activity/leisure groups to patients awaiting placement. These patients, if safe to do so, are now able to attend groups Monday through Friday, in person. This initiative allows these patients to get out of the room and socialize with peers. These groups consist of Child Life activities, yoga, music therapy, creative writing, and various arts and crafts projects put on by an outside organization. Once these patients are moved up to the inpatient medical floors, they gain access to more resources and are able to go on unit walks. Groups in the ED have been quite successful leading to a project around implementing groups on the floors. This will

be virtual and allow for socialization and therapeutic conversation.

Even with these innovative ideas, capacity is still high and growing. Fall to winter has consistently seen an increase in pediatric patients boarding for higher levels of psychiatric care. To try and get on top of this, Boston Children's has expanded to open a new psychiatric inpatient unit in Waltham, Massachusetts with 12 beds. Efforts for this unit began in the spring and opened this fall, quintessential for the expected increase in behavioral health patients over the winter months.

We are hopeful to see the day where our inpatient units are no longer consistently at capacity and there is not a prolonged delay for behavioral health patients to seek proper treatment. Until we get there, Boston Children's is determined to innovate and develop ways for our patients to receive quality care while awaiting psychiatric placement.

Lawrence General Hospital Closing the Gap Around Racial and Ethnic Disparities

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Greater Lawrence Family Health Center

Narrowing and ultimately closing the gap around racial and ethnic disparities has been a longstanding goal at Lawrence General Hospital. Two years ago, we hired a Diversity Equity and Inclusion Program Officer and established governance at the board and organizational levels with executive involvement. The DEI Steering committee oversees the work of 5 subcommittees: healthy equity, policy, activities and education, patient demographic data and workforce. Our healthy equity committee has created a DEI dashboard, using data from the hospital's EMR, that is able to break down patient demographics and apply those to social determinants of health and patient outcomes. This will be our foundation for obtaining meaningful data that can better break down areas where disparities exist and build systems to narrow that gap. LGH is working in conjunction with the Greater Lawrence Family Health Center (GLFHC) residents to further divide the dashboard into workable areas such as Maternal Child Health, to closely evaluate patient

outcomes and progress that could be linked with demographics, racial disparities, and social determinants of health and then, as part of the residents' projects, develop solutions to bridge the gap.

Another ongoing initiative that has helped our patient population obtain early access to obstetric care is flagging all positive pregnancy tests in our EMR. A positive test prompts a follow up call to establish obstetric care with the aim of encouraging early screening as well as consistent obstetric care throughout the patient's pregnancy.

Linguistic support has been a crucial part of decreasing poor outcomes for our patient population. Delays in care and confusion around management plans and discharge instructions can contribute to poor outcomes. We have worked with our DEI committee to ensure all of our instructions are in Spanish and have increased capacity and availability of in person interpreters. All our Family Medicine residents take an intensive Spanish course at the beginning of residency resulting in fluency for many of our physicians and our nurses on Labor and Delivery are actively enrolled in Spanish classes. We continue to find ways to utilize innovative technology such as video interpreters and handheld devices that will help bring communication to patients in a faster and more efficient manner. We are also working with our community and current interpreter services to discover methods by which we can increase our pool of interpreters to better service our patient population.

Within the My Care Family Accountable Care Organization (ACO), a partnership between LGH, GLFHC and AllWays Health Partners, timely prenatal care is an incentivized quality metric in which the ACO typically performs above goal (93.6%). The ACO covers approximately 41,000 Medicaid beneficiaries, the majority of whom live in Lawrence and identify as Hispanic or Latinx. Still, the clinical team have identified opportunities for improvement, including lack of adequate follow-up or evidence-based treatment plans for some patients experiencing pregnancies of unknown location and early pregnancy loss. In order to address these gaps in care, we developed a system for the Labor and Delivery team at Lawrence General Hospital, to track pregnancies of unknown location. Using this new system, the team regularly reviews cases and ensures that patients

have completed necessary labs, ultrasounds, and clinical follow up. A large group of health care professionals at our a Federally Qualified Health Center (FQHC) can utilize this system twenty-four hours a day to ensure safe and effective quality care is provided to this subset of their prenatal patients.

Additionally, through work within a multidisciplinary team, we advocated for the internal approval of mifepristone. We developed a policy for the safe and evidence-based use of mifepristone, so that patients who have an identified miscarriage have the option to receive the most up-to-date and effective pharmacologic management of miscarriage.

MetroWest Medical Center

Obstetrical Hemorrhage

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Obstetric hemorrhage is a major cause of maternal morbidity¹ and causes approximately 11% of maternal deaths in the United States². These deaths can be prevented through proper planning and consistent use of protocols.

In 2019, the MetroWest Medical Center postpartum hemorrhage (PPH) rate rose to 4.32%. The rise was concerning given the increased morbidity and mortality related to this postpartum complication. The Maternal Child Health staff worked quickly and collaboratively to develop and implement changes to decrease the postpartum hemorrhage rate approximately back to 2018 baseline of 2.99%.

Postpartum hemorrhage is an obstetrical emergency requiring quick assessments, diagnosis, and response. The entire planning process starts prior to delivery. Nursing staff complete a PPH risk assessment at time of admission and reassess at least every 8 hours thereafter. The patient's risk level is displayed on an electronic status board using a color-coded flag visible for all staff members to see. Patients who score a high-risk status are cross matched for 4 units of PRBCs and have two large bore IVs inserted during labor to ensure there is quick and reliable access should the need arise.

The group first targeted the measurement of blood loss. A leading recommendation from ACOG³ [Quantitative Blood Loss in Obstetric Hemorrhage | ACOG](#) is to utilize quantitative blood loss measurement over qualitative blood measurement, allowing for a more accurate and timely measurement of blood loss. This new measurement process was implemented in July 2019. Nursing staff were trained on the new equipment and process to ensure everyone was familiar with the changed expectations. Subsequently the volume target for blood loss was decreased from 1500ml to 1000ml to trigger an earlier activation of the Code Crimson protocol. Code Crimson quickly brings needed blood and blood products to the patient.

Postpartum Hemorrhage requires the use of specific medications. To assist nursing in retrieval of these medications, a PPH Kit was developed for use in the Labor and Delivery Omnicell. With one choice, all drawers containing uterotonic medications open simultaneously allowing the nurse to easily obtain the necessary medications shaving valuable minutes off the decision-making process. In addition, the PPH cart which contains all the equipment used to treatment postpartum hemorrhage, was moved to a central location in the unit, near the code cart, and is brought to all high-risk deliveries for easy and immediate access. But even the best protocols and equipment do not help if staff aren't prepared to handle an adverse event. Educational sessions, which include a simulation component, were developed to address different obstetrical emergencies. PPH was included as one of the modules. These training programs are mandatory for all staff working in Labor and Delivery (nurses, physicians, and surgical techs). In addition to the training modules, PPH drills are performed multiple times annually. Educational sessions, as well as real life emergency events, are debriefed to identify opportunities for improvement. Each month the records of all patients who experience a PPH are reviewed by the Nursing Director and trends are shared with the Medical Chair. Lastly, OB high risk rounds occur monthly to discuss pregnant patients who are considered high risk deliveries to determine the best site and/or plan

for delivery to achieve the optimum mother-baby outcomes.

All of these efforts combined resulted in a decreased PPH rate from 4.32 to 3.05% during the first six months of 2021, better patient outcomes, and a more confident, well-prepared staff.

¹Callagn WM, Kuklina EV, Berg CJ. Trends in postpartum hemorrhage: United States, 1994-2006. *AM J Obstet Gynecol* 2010;202:353.e1-6.

²Committee on Practice Bulletins-Obstetrics. Practice Bulletin No. 183: Postpartum Hemorrhage. *Obstet Gynecol* 2017; 130:e168. Reaffirmed 2019.

³ACOG Committee Opinion No. 794, Quantitative Blood Loss in Obstetric Hemorrhage. *Obstet Gynecol* 2019; 134:No 6.

Mount Auburn Hospital Enhanced Recovery After Cesarean (ERAC) Quality Initiative

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With over one million cesarean births performed each year in the United States, lowering maternal morbidity and mortality, optimizing maternal recovery, and promoting maternal-infant bonding is paramount. Enhanced Recovery After Cesarean (ERAC), is a comprehensive care bundle expanding the traditional surgical protocols for perioperative care to include obstetric and neonatal specific considerations, such as delayed cord clamping and skin to skin in the operating room. Additionally, ERAC protocols have focused on a multimodal approach to decrease the use of narcotic pain medication without negatively affecting patient or provider satisfaction.

In late 2019, the Mount Auburn Hospital OBGYN Department engaged a multidisciplinary group to develop and implement an ERAC quality initiative, initially trialed with patients having a planned cesarean birth. The group developed a comprehensive protocol, which included a new nursing pre-op education process, eliminated fasting, overhauled pre- and post-op order sets to include more aggressive management of perioperative nausea and emesis, use of Duramorph and scheduled non-narcotic pain medication, active management of bowel function, along with early ambulation. We also prioritized shared decision making with the patient

at the time of discharge to determine the amount of prescription pain medication needed.

Between May 2019 and October 2020, 124 patients underwent a scheduled cesarean birth. A manual chart review was conducted for a random sample of 20% of these patients. Eighty-three percent of the population were multiparous. Forty-two percent underwent a primary cesarean vs. 58% who had a repeat cesarean. The primary focus of our initial data review was the impact of our new ERAC protocol on post-op narcotic use and provider satisfaction.

The ERAC pain management protocol included pre-operative administration of acetaminophen, use of Duramorph (unless contraindicated), scheduled use of nonsteroidal anti-inflammatory agents and acetaminophen and an as needed order for 5 mg of oxycodone for breakthrough pain. When compared to our previous standard post-op pain regimen, patients following the ERAC protocol received 34% less morphine milligram equivalents (MME) of narcotic pain medication over their entire hospital stay (average LOS 3.5 days), than patients' previously received as scheduled narcotics in the first 48 hours post operatively. Additionally, 50% of the ERAC cohort did not use any post-op narcotic pain medication. Average postoperative pain scores were assessed (based on a traditional 10-point scale), on the day of surgery (1.97), post-op day #1 (3.3) and on the day of discharge (2.7).

Prior to institution of the ERAC protocol, our common practice was to send patients home with a prescription for 25 – 30 tablets of oxycodone (5mg) routinely. After an education effort around evaluating the level of narcotic use over the hospitalization and engaging the patient in conversation regarding the need for home pain medication, linked to our ERAC protocol, 71% of the patients participating in ERAC decided they did not want a prescription for narcotic pain medication at the time of discharge. Of those patients who did receive a prescription, approximately 57% received an average of < 10 tablets.

A provider satisfaction survey conducted via Survey Monkey, with a 52% response rate, 100% of providers rated their level of satisfaction with the new protocol to be "very satisfied" (75%) or "satisfied" (25%). Ninety-three percent of providers stated they received fewer pages for additional pain medication and 58% reported fewer requests

for post-op antiemetic medication. Overall, 61% of providers reported "fewer" or "many fewer" calls for any type of postpartum questions or concerns during the hospitalization.

While this initial exploration into an ERAC protocol seems favorable with respect to decreasing use of postop narcotics, we have much work to do. This process identified challenges in our workflow when trying to keep the mom-baby couplet together from the OR to recovery to postpartum.

Additionally, we plan to elicit feedback from our nursing colleagues, as well as our patients. In January 2021 our department expanded the application of ERAC to all cesarean deliveries and look forward to re-evaluation of a larger data sample with additional data points.

For additional information, please contact Leslie MacDonald MD at lmacdon2@mah.harvard.edu

NARCOTIC PAIN MEDICATION USE				
	Pre-ERAC First 48 hours (in morphine milligram equivalents)		Post-ERAC Entire hospital stay (in morphine milligram equivalents)	
PACU	20mg OxyContin DR x 1 (scheduled) 10mg Oxycodone IR x 1 (scheduled)	30 MME 15 MME	Duramorph x 16 hrs	
Postpartum	10mg OxyContin DR every 8 hr (scheduled)	90 MME	No scheduled narcotics	84 MME Average over the entire hospital stay
	Plus, option for 5mg Oxycodone IR every 4 hours prn mild pain OR 10mg Oxycodone IR every 4 hours prn mod/severe pain <small>*does not include any prn doses used over the hospital stay</small>	135 MME Scheduled for first 48hr post-op*	5mg Oxycodone IR every 4 hours prn	34% less than our patients received in the first 48 hours as scheduled narcotics prior to initiation of the ERAC protocol 50% of patients did not receive any additional narcotic pain meds post-op
Discharge	Electronic health record oxycodone prescription defaults to 30 tabs Practice pattern was to provide every patient with a prescription for oxycodone 20 - 30 tabs		71% of patients participating in ERAC did not go home with a prescription for narcotics Of those given a narcotics script, 57% received an average of < 10 tabs Provider behavior change to include shared decision making with patients regarding discharge meds	

Southcoast Health
New Beginnings: Southcoast Health's Evidence-Based Approach to NAS/NOWS.
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Deborah Toffey, RN, MS
Alexis Keeler, MBA, LSS, MBB
Michael Pepi, MD, FACOG
Dani Hackner, MD, MBA, FACP, FCCP

Seven out of every 1,000 babies born in the United States are diagnosed with Neonatal Abstinence Syndrome (NAS) or Neonatal Opioid Withdrawal Syndrome (NOWS).¹ In Massachusetts the rate is

nearly double, and the South Coast region has very high rates.² Caring for newborns with NAS is resource intensive with 8 times higher costs and 6 times higher average length of stays.³ The Finnegan Neonatal Abstinence Scoring Tool (FNAST) has been used to identify and treat NAS.⁴ In 2014, an innovative approach called Eat, Sleep, Console (ESC) was developed, emphasizing non-pharmacologic, family-centered approaches, rooming-in, kangaroo care, and creating a conducive, low-stimulation environment with breastfeeding and soothing techniques.⁵ ESC has demonstrated decreases in pharmacologic interventions, length of stay and hospital costs.⁶

In March 2019, Southcoast Health joined Massachusetts hospitals in the Perinatal- Neonatal Quality Improvement Network (PNQIN) on ESC.⁷ Comparing fiscal year 2017 performance and FY21 2019 performance, the ESC has been associated with a 60% reduction of Special Care Nursery (SCN) admissions from 85 to 34 admissions during October to June periods. Southcoast has also been able to reduce pharmacologic therapy with a 54.4% reduction in first line morphine and 51% reduction in second-line phenobarbital. For those requiring pharmacologic intervention, the median LOS has improved 16.7% from 18 days to 15 days. Promoting family-centered care and reducing SCN admissions have been associated with 56% increases in mother-baby dyads discharged from couplet-care units. Breastfeeding rates have also increased from 36% to 46% for mothers on (MAT).

Southcoast Health's multidisciplinary team has recognized the care needs to start before hospital admission and continue after discharge. The program begins with a referral process early in pregnancy to identify persons with a history of opioid use disorder. New Beginnings provides opioid-related education on NAS and NOWS, information about Southcoast's approach including Eat Sleep Console, and timely guidance. New Beginnings shares community resources, works with community partners, and maintains contact with moms and families for 12 months post-partum. The Southcoast New Beginnings NAS/NOWS program has had exceptional success when referrals are received prenatally. When referrals are received by 20 weeks gestation, 90% of babies are discharged home with mother as the primary caregiver. For early referrals, Southcoast family centered units and the New Beginnings program achieve 100% discharge home to family. In 2020,

even during the challenges of the COVID-19 pandemic, Southcoast expanded postpartum care services. To date, Southcoast has cared for 87 moms and children with opioid-related diagnoses during their postpartum period under New Beginnings. Southcoast Health continues to be committed to innovative, evidence-based approaches to improve the care experience and outcomes for this vulnerable population.

¹Data and Statistics About Opioid Use During Pregnancy. (2021, July 16). Retrieved from Centers for Disease of Control and Prevention: <https://www.cdc.gov/pregnancy/opioids/data.html>

^{2,3}HCUP Fast Stats - Map of Neonatal Abstinence Syndrome (NAS) Among Newborn Hospitalizations. (2020, 8 27). Retrieved from Agency for Healthcare Research and Quality: <https://www.hcup-us.ahrq.gov/faststats/NASMap>

^{4,5}Grossman MR, B. A. (2017). An initiative to improve the quality of care of infants with neonatal abstinence syndrome. *Pediatrics*, 139(6), e20163360. doi: <https://doi.org/10.1542/peds.2016-3360>

⁶Wachman, E. G. (2018). Quality improvement initiative to improve inpatient outcomes for Neonatal Abstinence Syndrome. *Journal of Perinatology*, 38, 1114–1122. doi: <https://doi.org/10.1038/s41372-018-0109-8>

⁷Wachman, E. H. (2020). A quality improvement initiative to implement the eat, sleep, console neonatal opioid withdrawal syndrome care tool in Massachusetts' PNQIN collaborative. *Journal of Perinatology*, 40, 1560–1569. doi: <https://doi.org/10.1038/s41372-020-0733-y>

Sturdy Memorial Hospital

Obstetrical Hemorrhage

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The United States of America is one of the wealthiest developed countries in the world. Despite all our country's success and the development of clinical policies and protocols to improve the care of pregnant patients, women continue to die in childbirth. In 2019, the CDC reported 20.1 deaths per 100,000 births which is higher than the prior year of 17.4 deaths per 100,000 births.¹ The American College of Obstetricians and Gynecologists (ACOG) notes the leading cause of those maternal deaths is related to a post-partum hemorrhage of which 75% are deemed preventable.²

In response to these statistics, our community hospital created and implemented a hemorrhage safety bundle to improve maternal intrapartum and post-partum care and reduce adverse outcomes related to post-partum hemorrhage. Portions of a response to post-partum hemorrhage were present on our obstetric unit but they existed in isolation.

Beginning in 2019, our team of nurses, educators, managers, and providers utilized hemorrhage bundles from the California Maternal Quality Care Collaborative (CMQCC)³

<https://www.cmqcc.org/content/obstetric-hemorrhage> and the Alliance for Innovation on Maternal Health (AIM)⁴ <https://www.aimcci.org/> to aid in the development of a standardized obstetric post-partum hemorrhage response.

A system-level change was needed, and an interdisciplinary conversation began so we could develop a shared mental model to move forward with equitable policies and processes. Three necessary changes were identified. This included the need to quantify blood loss, implement the active management of the third stage of labor and standardize the administration of oxytocin for vaginal and cesarean deliveries.

Our team determined that best practice would be to utilize the four components of AIM Maternal Safety Bundle which included readiness, recognition, response, and reporting.⁵ We needed to be ready at all times for every patient. Readiness begins as soon as the patient arrives on the unit by identifying obstetric hemorrhage risk factors. A risk assessment tool was built into our admission process and electronic health record (EHR). Additionally, a provider order set was built within the EHR to align with the nursing hemorrhage risk assessment guiding practice to prepare for high-risk patients. To further prepare for rapid management of a hemorrhaging patient, a standardized practice was implemented to type and screen all mothers who were admitted for labor, labor induction or cesarean section.

Another key component of readiness was to ensure that our hemorrhage cart contained all items needed to rapidly care for the hemorrhaging patient and that it was organized in a way that allowed for the most efficient utilization. Staff participated in reorganizing the cart to include necessary blood draw items, tranexamic acid premixed solutions, vaginal tamponade kits, quick reference checklists, and staging of hemorrhage risk. To ensure the cart was always ready for an emergent case, it became part of our daily checklist to review its contents.

Addressing recognition of hemorrhage and signs of patient deterioration, the second component of the AIM bundle, was a much larger task that included implementing a process to consistently measure blood loss for early intervention.⁶ The

Association of Women's Health Obstetric and Neonatal Nurses provided a quantitative blood loss (QBL) process which was utilized to guide our practice.

Staff practiced and became proficient at measuring blood loss by extracting amniotic fluid volume and dry weights to report QBL for each delivery. Validating QBL through comparison of pre and post hemoglobin and hematocrits, patient symptoms and comparison to estimated blood loss (EBL), it became clear how important utilizing QBL, as opposed to EBL, was for accurately recognizing hemorrhage in our patients.⁷ The use of QBL has now become our standard practice.

Once we had created a recognition process, we turned to addressing the third portion of the AIM bundle, our response to a hemorrhaging patient.⁸ To solidify and standardize our response, didactic presentations were held to begin training of staff. Classroom presentations and open discussions brought us to a shared mental model allowing us to build our response team. The team practiced its response to hemorrhage by participating in simulation drills. Simulations occurred bi-monthly, and debriefing followed each drill to identify strengths and areas of improvement.

Lessons learned from our first drill included the presence of more people in the drill than was needed, difficulty training all providers due to competing commitments, excessive movement of staff within the room, poor role delineation and a lack of situational awareness. To address the identified challenges, a self-paced simulation room was created for which led to 100% compliance but still lacked practice in the closed loop communication. The next drill was conducted daily over the course of a week to allow all to participate. The daily drill was much more successful due to smaller groups attending each drill and having clearly defined roles and responsibilities for all involved staff.

Based on these drills, we identified that the following members were necessary as part of the response team:

- The provider's main role is to determine and correct the source of bleeding with assessment.
- The charge nurse is the moving person in the room and the leader of the response
- The primary nurse remains on the patient right side and is responsible for patient assessments

- The medication nurse is responsible for drawing and administering medications
- The blood administration nurse starts the second IV and monitors the blood product administration
- The recorder tracks time and reports progress.
- The baby nurse who assists with family support and communication
- The unit secretary who notifies all staff and resources needed to assist with the patient
- The hospital nurse resource coordinator who arrives in the event a transfer to another unit or hospital is required.

The benefits of creating and standardizing of our process were identified in our first post-implementation hemorrhage case. The debriefing noted that the experience had a calm and organized environment. The hemorrhage was recognized in the early stages and interventions were proactive. The response team quickly fell into clear roles that were maintained throughout the event. All resources were actively engaged and a part of the team approach for excellence.

Finally, in addressing reporting, the fourth component of the AIM bundle, we review all hemorrhage cases for appropriateness of care,

patient outcome, and identification of areas of improvement.⁹ Obstetric emergencies require ongoing education and evaluation of processes that work for each institution. To ensure continued success with our new process we will conduct bi-monthly simulation drills to maintain competency and adjust to hospital changes that naturally occur. Teamwork, collaboration, and clear communication allow for early recognition of potential maternal deterioration and aggressive treatment to meet our goal of the prevention of maternal morbidity and mortality.

¹Hoyert D.L. Maternal mortality rates in the United States, 2019. NCHS Health E-Stats. 2021. DOI:

<https://doi.org/10.15620/cdc:103855>.

²Sleutel M., Newcomb P., Elling C., Beaverstock L., Peron T., Effect of and obstetric hemorrhage bundle on clinical outcomes and clinician perceptions. Nursing for Women's Health. Aug.2021:248-256. Doi:10.1016/j.nwh.2021.05.003

³California Maternal Quality Care Collaborative. (2015). OB hemorrhage toolkit V 2.0. <https://www.cmqcc.org/resources-tool-kits/toolkits/obhemorrhage-toolkit>

^{4,5,6,8,9} Council in Patient Safety in Women's Healthcare. AIM Patient Safety Bundle. <https://www.aimcci.org/>

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Reporting Reminders

Ambulatory Clinics & Acute Care Hospitals with Inpatient Obstetrical Units
Annual & Semi-Annual Reports is due on March 30, 2022

Non-Acute Care Hospitals & Acute Care Hospitals without Inpatient Obstetrical Units
Annual & Semi-Annual Reports is due on May 30, 2022

All Hospitals and Ambulatory Clinics
Q4 2021 Patient Fall and Pressure Injury Report was due on January 30, 2022

Q1 2022 Patient Fall and Pressure Injury Report is due on April 30, 2022