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NICU Disaster Preparedness: *Were We Ready for COVID-19?*



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The terrorist attacks of September 11, 2001, along with natural disasters such as Hurricane Katrina, have led to decades of disaster preparedness planning. Despite the attention and focus on planning, many studies have found that hospitals are ill prepared to appropriately manage extended disasters. The author completed her doctoral program capstone project on neonatal intensive care unit disaster preparedness. This article discusses lessons learned during the coronavirus disease 2019 (COVID-19) pandemic and what future disaster preparedness plans must consider.

Disaster can strike at any time and in any place. When disaster strikes a hospital, especially one with a neonatal intensive care unit (NICU), the stakes are high. A recent systematic review of the literature demonstrated that nurses are not prepared for and do not know what their role is in a disaster.¹ The American Academy of Pediatrics (AAP) supports the findings of Labrague et al.¹ and identifies that technology-dependent individuals, such as our most vulnerable NICU patients, are disproportionately affected by disasters.² Hospitals must be prepared for disaster and as a part of the preparation must consider a specific plan for their NICUs, NICU families, and staff.² Four months into a worldwide pandemic, the question shifted from preparedness to sustainability. Although we may have been prepared for disaster, we were not prepared for a pandemic of this magnitude. As coronavirus disease 2019 (COVID-19) continues to play out before us, our response and lessons learned will reshape future disaster preparedness planning.

OVERVIEW

In September 2001, the world as America knew it changed. In the years to follow the terrorist attacks of 9/11, public policy and health care organizations have implemented changes to improve disaster response. A report from the Department of Homeland Security published in September 2011 reported that disaster preparedness is a shared responsibility and highlighted the planning and preparation needed at an individual, regional, and national level.³ Changes to date, however, have not prepared health care organizations to appropriately manage largescale or extended disasters.⁴ Ten years from now, we will be talking about how the pandemic of 2020 changed health care as we knew it, but for now, we are living that change.

MARCH 2020

Much like we can remember other key dates, we will remember March 2020 when COVID-19 became a reality for health care providers in the United States. For a mid-sized community hospital in North Texas, the reality hit on March 8th after just 6 days of system planning. By March 18th, the hospital had a manned incident command center that ran 24/7 through June 3rd; the manned incident command center re-opened on July 10th and transitioned to a hybrid manned/virtual command center on August 19th.

Previous disaster planning included plans for evacuation if operations could not be sustained, especially for the NICU. This pandemic has required sustained operations through conflicting reports and a multitude of changes. The early focus for Texas Health Resources (THR), a faith-based, nonprofit health system in Dallas/Fort Worth Texas with 27 hospital locations, was on adult beds, but as pregnant patients began to test positive for the virus, it quickly became a rush to ready the NICUs. NICUs come in various

KEY POINTS

- Decades of disaster preparedness allowed teams to implement immediate measures when COVID-19 hit.
- Neonatal intensive care unit-specific disaster preparedness is vital to ensure appropriate care for our tiniest patients during and after a disaster.
- The need for sustained disaster operations during a pandemic will change how health care leaders plan for future disaster preparedness.

shapes and sizes. When the author's hospital planned construction for their current 16-bed NICU, they went with an all private room model. Many of the other NICUs within the health system still have a more open bay style. Differences in bed configuration increase the challenges that the NICU faces with respiratory illnesses such as COVID-19.

The author was asked to participate in system planning for NICU and women's response plans to COVID-19. This planning involved the creation of a subcommittee that consisted of frontline providers, infection prevention experts, and system leaders. The goal was to create a clinical guideline for the care and treatment of COVID-positive moms and babies. As organizations such as the AAP and the Centers for Disease Control and Prevention (CDC) continue to release updated recommendations, the committee and guideline had to be fluid. Over time, the frequency and intensity of the meetings reduced, but at the writing of this article, the subcommittee continues to meet biweekly on an as-needed basis.

NICU DISASTER PREPAREDNESS PRE-COVID-19

Disaster can be defined as any event that significantly impacts the functioning of a group of individuals and exceeds the group's ability to sustain with their available resource.² A disaster plan specific for the NICU must take into consideration the actions that the NICU would need to take if they lost vital resources such as water and power. The plan should also include how staff would prepare for a surge of transferred patients if they became the receiving NICU for a disaster occurring elsewhere.^{2,5} Further, as NICU leaders plan for disasters and possible evacuation, they must understand the emergency medical services (EMS) capacity and capability.⁶

The Department of Health and Human Services, the National Incident Management System, the Federal Emergency Management Agency, and the Occupational Safety and Health Administration provide guidelines for disaster preparedness. Others, such as the CDC, the Centers for Medicare & Medicaid Services, The Joint Commission, and the Hospital Preparedness Program, provide input into the guidelines and hold hospitals and providers accountable for implementation and compliance.⁷ The end goal of disaster preparedness is for everyone to be responsible for his or her part in the process to mitigate risk and to implement procedures to alleviate human suffering resulting from a disaster.³

In her doctoral program, the author developed a disaster preparedness plan for the NICU. The author used pre-existing standard language for disaster preparedness to develop the NICU guidelines.³ Interventions identified included risk assessment that

addressed geographical natural disaster potential, consideration and action plans for internal and external disasters, and instructions for individual and family preparedness in the event of a disaster.⁸ Unfortunately, the plan and roadmap created did not count on a novel coronavirus that would create an unprecedented pandemic response.

WHY FOCUS ON NICU?

Some might wonder why have a separate focus on NICU. NICU patients pose a unique challenge regardless of the type of disaster. Missing from many hospitals is a disaster preparedness plan specific to the NICU.² NICU patients are technology-dependent and fragile. Disasters that affect the hospital are also likely to affect the NICU patients' families. If an evacuation is necessary, there is a risk for family separation.² Family separation can be short—the time it takes for parents to reach the new hospital where their newborn is transferred—or it can be longer if conditions exist that prevent the parents from rejoining their newborn in a timely manner. Family separation can also occur within families outside of the NICU baby, including separation between parents, between parents and grandparents, or between parents and older children. Because the risk of separation during a disaster exists, families should have a communication plan that includes who calls who, and a central location for members to meet if separated.⁹

With COVID-19, a new type of separation exists, separation of symptomatic or asymptomatic COVID-positive parents from their neonate in the NICU. Hospitals and health care teams are faced with a new dilemma—whose guidelines to follow and how to mitigate risk of COVID exposure/spread—while allowing for the bonding needed between parent and child. What if the parent(s) are too sick; how do we identify an alternate caregiver and who will make decisions for the baby? These considerations, and more, will need to be included in future disaster preparedness planning.

NICUs are a microsystem of the hospital and pose unique challenges during a disaster.² NICU babies are technology-dependent, making them at risk for an adverse outcome in a catastrophe.¹⁰ A critical component of disaster preparedness planning for a NICU is family separation risk mitigation and reuniting families if separation occurs.¹¹ During orientation to the NICU, families should be encouraged to create their own family disaster preparedness plan that includes a communication strategy for their family.⁹ The strategy might consist of alternative contacts for hospital staff, as well as directions on who will contact whom and where the family will meet if they cannot return to their homes. NICU staff should also be

encouraged to develop family disaster plans so that when disaster strikes, they can focus on caring for their patients and not worrying about home.

With COVID-19, there is an added concern for exposing family to the virus. Many nurses and health care workers identified strategies to reduce risk of transmission that may become best practices to be included in future disaster preparedness plans. These strategies included showering/changing clothes before leaving work or immediately upon arriving at home and before interacting with family, staying at hotels when several shifts in a row were worked, and avoiding situations in which close contact with others would be required. Throughout the pandemic to date, the recommendations for face coverings, social distancing, community gathering, and essential work have changed frequently, causing confusion, frustration, and caregiver fatigue.

A key consideration of many hospital disaster plans is surge capacity. Surge capacity allows for local and regional preparedness, especially for a mass-casualty event.¹² A vital component of the NICU disaster preparedness plan considers surge capacity as well as a plan for where the NICU will evacuate to if the disaster at hand requires it.⁶ Disasters can be internal or external to hospital operations, and preparedness planning must include risk assessment and geographical considerations.¹² As NICUs plan for disaster, the response must consist of more than just the physical restoration. The planning and preparedness must address mental, emotional, and psychological factors that nurses and others will face in the aftermath of the disaster.¹³ Disasters such as Hurricane Sandy have highlighted the inadequacies that exist and have provided an opportunity to refine and revise plans so that individuals and communities can have trust in the identified plan.¹⁴ Disaster preparedness is everyone's responsibility, and as such, community disaster plans need to consider and account for vulnerable populations.¹⁵

ETHICAL AND LEGAL CONSIDERATIONS

Nurses and other health care workers are held to a higher moral standard than the general public with regard to disaster preparedness and response.^{16,17} In a disaster, resources may become scarce and the scope of care able to be delivered reduced. Pre-planning will facilitate difficult decisions during an actual disaster.⁴ The NICU disaster preparedness plan should include what changes to standards of care may be necessary during a disaster or evacuation, and a framework for decision-making that can be used in an actual disaster.¹⁶ The inclusion of ethical situations in a simulation may assist caregivers in mental exercises that will help with the out-of-box thinking required

during an actual disaster or evacuation situation.⁶ Finally, the consideration of the potential need for ethical decision-making before a disaster may alleviate additional stress when these in-the-moment decisions need to be made.

In the post-COVID-19 era, health care workers must review and reflect on the ethical dilemmas encountered during the pandemic. These dilemmas will guide future planning and help leaders prepare the next generation of health care workers for disaster. The ethical, policy, and political challenges during COVID-19 will guide future decision-making at local, regional, and national levels. Health care leaders will need to be advocates and contributors as future disaster planning guidance is developed.

PREVENTION/MITIGATION

An awareness of potential risk is a necessary component of disaster preparedness.² During a disaster staff may be asked to work outside of their comfort zone, with less than optimal supplies and conditions, and with different individuals or teams adding to their stress and emotions.⁸ Necessary components of the disaster preparedness plan include staff preparedness for their home and family, training, awareness of risk and participation in disaster drills.^{11,12,18} Nurses and health care workers must take responsibility for their preparedness which includes family care and communication strategies to ensure they can focus on implementing their hospital disaster plan without the added burden of worrying about their family's safety.¹⁹

An additional component of preparedness is to consider the capability and capacity of EMS during a disaster.⁶ A realistic plan can be developed and implemented if resource limitations are known ahead of time. Likewise, including identification of potential alternative locations where the NICU can be moved will save precious time in the event of an actual disaster requiring NICU evacuation. The author was able to use this component of preparedness when planning her hospital's NICU COVID-19 response. The team was able to create a COVID unit for babies born to moms under suspicion of COVID and/or who were COVID positive.

COVID-19 RESPONSE

As COVID-19 became a reality in the United States, many were faced with conflicting information, changing guidance, and an outpouring of public opinion. The response to COVID-19 quickly became political, with strong opinions on both sides. Hospitals, health care leaders, and health care workers faced a novel coronavirus with rapid change to guidance that was not always based on science or evidence. Hospital and health care leaders were faced with a constant

challenge of keeping their staff, patients, providers and visitors safe, while balancing the guidance with available personal protective equipment (PPE) and supplies.

Nurses and other health care workers have always had to be concerned with infection prevention and control. COVID-19 has taken this concern to a new level. Community spread, early estimates of inadequate hospital resources, and concerns for lack of PPE added to an already stressed team. As hospital administrators, infection prevention specialists, and nurse leaders worked tirelessly to keep up with the changing reality, NICU teams had to identify strategies for caring for patients with COVID-19 or with exposure to COVID-19. These strategies were often developed after much discussion and input, and rarely met without question and resolve from frontline staff!

CONCLUSION

The COVID-19 pandemic of 2020 has tested the disaster preparedness of health care in the United States and beyond. We have always known that disaster can strike at any time and in any hospital; the previous disaster planning allowed hospitals and health care systems to mobilize their incident command, while allowing them to focus on learning everything that they could about the novel coronavirus known as COVID-19. Hospitals need to have disaster plans, and specific plans for specialty populations such as the NICU are critical for successful disaster response. In terms of the COVID-19 pandemic of 2020, time will tell how it will alter the way hospitals and NICUs plan for disaster in the future.

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