Courtesy of North Carolina Office of EMS.

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State of Response: Collaboration and Communication in the Aftermath of Hurricane Helene

While most hurricanes that affect North Carolina make landfall on the state's Atlantic shores, Hurricane Helene devastated mountainous areas of Appalachia, causing unprecedented flooding, widespread damage to roadways (including the Blue Ridge Parkway), and necessitating the evacuation of numerous residents, many of whom needed medical assistance. ASPR TRACIE met with the following members of the North Carolina State Emergency Response Team (SERT; they are listed alphabetically) to learn how and where they stood up temporary medical facilities to treat and serve evacuees, many of whom had lost everything:

- **Kimberly Clement (KC)**, MPH, North Carolina Office of Emergency Medical Services, Healthcare Preparedness Program Manager
- **Laura Dickerson (LD)**, MSN, RN, NE-BC, Clinical Operations Director, Heart Services, Duke University Hospital
- **Laura Fick (LF)**, BSN, RN, Duke University Health System, Trauma/ Orthopedic Group
- **Tripp Winslow, III (TW)**, MD, MPH, Emergency Medicine, Atrium Health, Wake Forest Baptist and Professor, Emergency Medicine (Wake Forest University, Winston-Salem)

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Hurricane Helene Recovery

John Hick, ASPR TRACIE Senior Editor (JH)

Please tell us about your roles when you deploy with the state.

KC

I am North Carolina's Healthcare Preparedness Program Manager; the program is housed in the North Carolina Office of Emergency Medical Services. We oversee medical deployments as part of the State Medical Response System (SMRS) and serve as the lead for our ESF-8 work.

Both Laura Fick and Laura Dickerson serve as Chief Nursing Officers for our State Medical Support Shelters (SMSS); they have been involved in nearly every medical shelter operation for the past seven years. Dr. Winslow has been heavily involved in many different aspects of the program but typically goes to our mobile emergency department. He also helped

us with the concept of community care sites during the Helene response. He was the very first physician we deployed to this response.

TW

I have served as the state EMS Medical Director since 2011, where I help oversee the state EMS and trauma system and work with the SMRS.

LF

I have been a registered nurse for 33 years. In 2018, I got involved with State Medical Assistance Teams (SMATS), starting with the SMSS's, leading Duke University staff in medical shelters. Since that time, I have deployed to multiple incidents including Hurricanes Helene, Floyd, and Florence. I also serve on the North Carolina Central Healthcare Coalition.

LD

I have been a registered nurse for over 37 years. I am grateful for the opportunities I have had over the years to serve in a leadership position on the SMAT during multiple incidents.

JH

Please describe the umbrella oversight and deployment process for the state's teams.

KC

Our State Medical Response System (SMRS) provides umbrella coordination and oversight. SMRS is comprised of several partners including from the state and local government, private hospitals, non-governmental organizations, and volunteer organizations. When we have an activation, that is who we bring together to begin the deployment process. All six of our state's healthcare coalitions are hospital-based and all from Level 1 and 2 trauma centers. Working with these large systems with so many assets enables all our coalitions to stand up field medical sites (primarily tent systems), SMSS, and fatality management assets. We deployed our medical support units for the first time during the response to Helene. Each healthcare coalition and the state have their own warehouses. The bulk of our funding has come primarily from the Hospital Preparedness Program with additional funds from the state and private grant sources.

Figure 1. Photo of SMAT Truck. Courtesy of North Carolina Office of EMS.

JH

How is the medical support unit configured?

KC

These small tagalong trailers are set up for 3-4 care areas. We typically use these at major special events like the state fair or a large marathon. If a patient is significantly ill and EMS is needed, the patient is brought into the unit where there is air conditioning and full medical care.

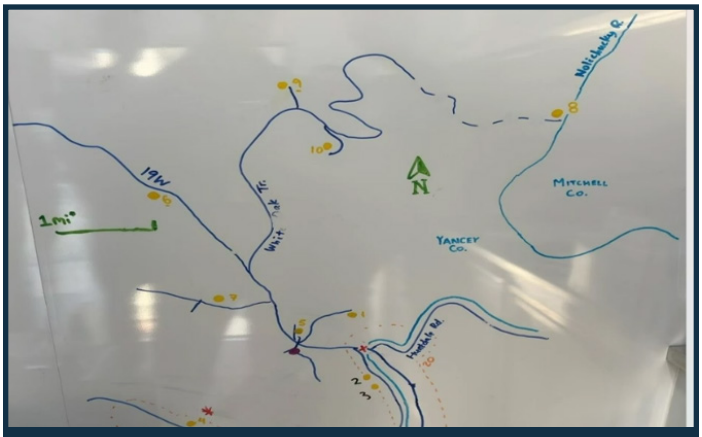

Figure 2. Photo of hand drawn map indicating community outreach areas accessible via ATV. Courtesy of North Carolina Office of EMS.

TW

Our initial mission was to use these units to provide urgent care. In the Helene response, the Office of EMS realized we needed smaller units with less footprints due to access issues in this part of the state (versus the larger footprints we were used to on the eastern, more coastal areas of NC).

We weren't used to being as isolated as we were, and we quickly realized we were also going to be dealing with traumas in addition to urgent care needs. For example, one of our paramedics was ejected off an all-terrain vehicle (ATV) and medevac could not reach him the first night. There were multiple car accidents or incidents where cars drove off cliffs, and our providers had to carry out more technical rescue and care for more trauma cases.

We also carried out a significant amount of community outreach to help increase residents' trust in us as an agency representing the state government. In Figure 2, the yellow marks indicate where we had volunteers—many who were veteran healthcare workers—regularly conducting outreach with residents using ATVs to access areas where roads were impassable. The local government was not able to reach these areas for some time, so we know our outreach was appreciated by community members.

JH

Did you have to use ATVs to get into these areas because people could not reach existing healthcare infrastructure due to damage?

TW

Yes, there were so many impassable roads that we had to drive all the way south of Asheville to where 26 was shut down, drive around Highway Patrol barricades, cross into Tennessee, and back down the road in Figure 3, where we then had to avoid potholes and drive through someone's front yard to access our site. The medevac couldn't land at night because of powerlines directly over the area. We used ATVs to get to some patients who could not leave their homes.

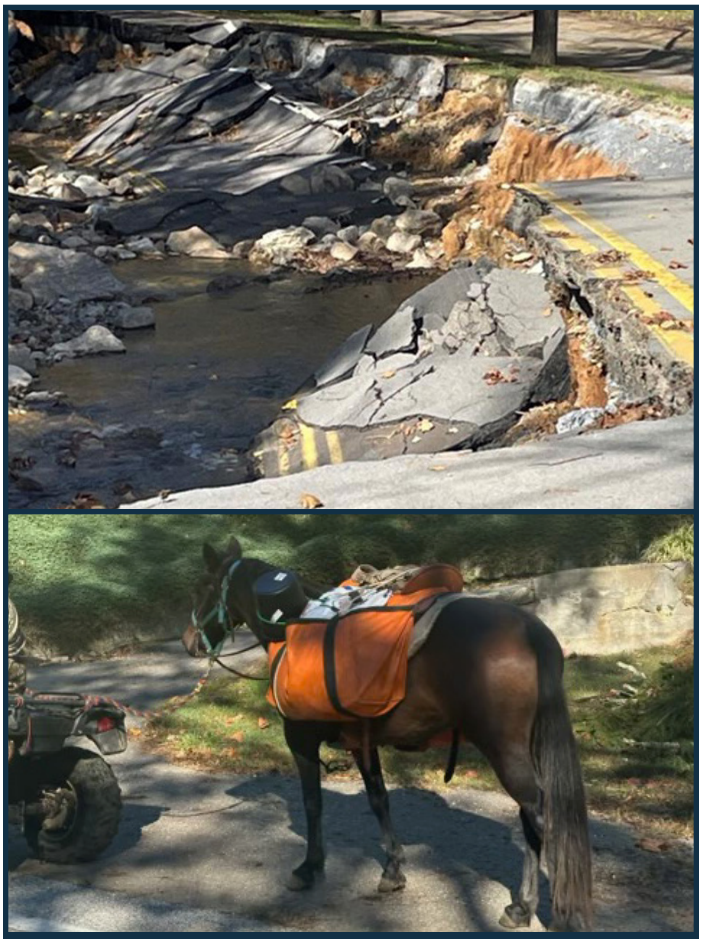

Figure 3. Photos of a damaged road and a horse used to deliver supplies. Courtesy of North Carolina Office of EMS.

KC

We were also concerned that sending larger trucks in and out of such a delicate area would negatively affect whatever little access we had. Instead, we sent in small trailers, set up some tents and generators, and did supply runs every day or two. This is the first time we have ever deployed in this fashion, and it was due to the terrain and infrastructure damage.

JH

How many medical support units got deployed during the response?

KC

We set up five community care sites in five different locations and saw just over 1,000 patients. We opened the first site on October 8 and we closed the last one down on November 17.

JH

What was the schedule of rotation, and who made up the teams?

KC

Our SMATs are comprised of people who currently work in or are retired from healthcare careers and some with no healthcare background who want to support the teams. During this response, we stood up a separate team of staff responsible for deploying and overseeing teams that staffed nine total sites: five community care sites, two mobile emergency departments, and two state medical support shelters.

Figure 4. Staff use an ATV to reach patients after the storm.

TW

In addition to providing medical care, it was critical for us to show that the government was there and part of the greater whole, including the community. There was some cynicism about the state, local, and federal government's ability to assist, and for a period, we were the only government presence in that area.

JH

Did law enforcement support those sites?

KC

We had security or law enforcement at every site. Securing law enforcement and ensuring contracted armed security providers were equally trained was one of the challenges we faced during the entire response. We've talked about this a lot since the response and how we need to identify the right security staff for the situation. For example, we have a written policy for those assigned to our sites on rules of engagement that is designed to protect the healthcare space and staff. We found that non-sworn law enforcement who did not have the same training did not understand or follow that policy as much as sworn officers did.

JH

Describe what a State Medical Assessment Team looked like during this response. What kind of medical and other support was provided in a shelter?

LF

Shelby Mission Camp was staffed by a diverse team with varying levels of experience. It had the capacity to treat up to 100 patients and included physicians, pharmacists, case managers, physical and respiratory therapists, registered nurses, and more. There were 120 DukeHealth staff (and others from various entities) deployed here across the three weeks; Laura and I took weeklong turns overseeing the shelter for the entire duration.

Figure 5. Photo of trailers. Courtesy of Andy Mills.

LD

We had support from several logistical teams who also helped us troubleshoot issues before and after they emerged. CapRAC and MCRHC, SMATs from two other North Carolina healthcare coalitions, provided us with medical supplies.

LF

The shelter mainly focused on providing patient centered care to people who came to us because they had been evacuated, had medical needs, and didn't meet criteria for general shelters. Many evacuees in Shelby had lost everything, including their homes, vehicles, and family members. This was a very emotional experience for them and deployment for all of us. Shelby Mission Camp was located on a Baptists on Mission property, and the congregation significantly supported the response by providing volunteers, food, prayer circles, and access to a chapel. The Ambulance Strike Team—comprised of hospital case workers, discharge planners, physical therapists, and others—worked with nursing staff to reconnect family members and secure in and out of state support for evacuees. Grief counselors from outside the facility supported patients and provided pet therapy in the shelter. We also engaged patients in daily activities like movies, birthday celebrations, and exercise. We were there for a long time.

Figure 6. Photo of cots in Shelby Mission Camp. Courtesy of Andy Mills.

LD

Having the right location for these shelters is so important. Sometimes you don't have a lot of choice, but in this case, we had a shelter that had good facilities for our patients, families, and our staff and it was a very safe facility with community support as a bonus.

JH

Why did you choose Shelby as a medical shelter location?

KC

We typically stand up medical support shelters after hurricanes and floods on the east coast of the state and have vetted locations; we knew that doing this in the mountains would be more difficult. We started making phone calls a few days before Helene was expected to hit. As the storm neared, the flood zones expanded, so we had to go through 6-7 rounds of calls to ensure our shelter would be located outside of the flood zones. Shelby is in Cleveland County, southeast of Asheville and right near the South Carolina border. Based on the forecast, it was the safest location we could find, and it aligned well with the checklist we use to determine shelter site suitability. Our secondary location was an empty wing of a hospital in Caldwell County, also outside of Asheville.

JH

On a related note, how did you decide where to put your assets and where to send your teams to conduct reconnaissance?

KC

We relied on the 911 system. Because of the great relationships within the Office of EMS, we were able to reach out to our county EMS directors and ask where they saw the most need and patients that needed extra support.

JH

Did you experience any utility outages at the shelter sites?

KC

We try not to set anything up without a backup generator and we bring a second generator with transfer switches as a secondary backup to ensure we have power for patients who are dependent on ventilators and similar equipment. We have seen storms change direction enough so many times that we know we have to be self-sufficient, so we always have backups to our water, food, and medicines.

JH

What is the level of support for pharmaceutical needs in your general shelters, and what is the criteria to referring people to your medical shelters?

LF

We have a pharmacist on our team around the clock for our medical shelters. We maintain a cache of medication in a locked room and for this response, our medication was supplied by time it came from WakeMed Health & Hospitals. We keep a running list of shelter needs, and we network with a local pharmacy and pharmacist to acquire medication outside of our cache. We were also able to send our logistics team to pick that up. In some cases, family members who also evacuated did not have their medication with them, so we were able to tap into our cache and connect with local pharmacists depending on needs.

LD

There are specific criteria that differentiate between a regular shelter and a medical shelter. We had a very thoughtful intake process that provided care for surge of evacuees that came to us. We would screen a patient with the incident commander, the medical team, Laura and myself and have a thoughtful discussion about whether the patient met certain criteria and would be need to stretch capacity to accommodate them. We also provided support to non-medical shelters, offloading some of the patients who needed more skilled care.

We have worked hard to do a lot of trailblazing and grassroots work with local hospitals, to the point where if we need one to quickly offload their patients, they now package the medications as if they were discharging the patients. This allows us to maintain our cache as much as possible.

We had over 300 people who chose to deploy to medical sites, who worked over 30,000 hours and 2,000 shifts. Our healthcare system puts everything aside when things go wrong and steps up to support each other. Nearly every system reached out to ask how they could help and who did we need them to send. Their willingness to accept that they were going to be slightly short-staffed while dealing with this significant response, and those people who stayed behind to do the extra work, helped make it possible for us to do our jobs in the shelters. I cannot say enough about how proud I am of this system and the collaborative nature of their work.

--Kimberly Clement

LF

One of our overall goals is to keep these patients out of the local hospitals, and we were able to do that successfully.

JH

How did you manage individuals with more complex medical needs (e.g., dementia or behavioral health issues) in a congregate area?

LD

The beauty of this facility is it had a large common area where we could put cots and partitions. Because it was a mission camp, we also had individual isolation-capable and bunk rooms. Our logistics team helped us rearrange the rooms; we grouped patients who had more needs in the same space to make it easier for our staff to care for them.

We were very focused on workplace safety during the Helene response. Should a patient become mentally unstable, a threat, or just a flight risk, we had criteria for moving them to a different location. While we experienced some unusual patient behavior, it did not put any patients or staff at risk.

JH

Did you use any virtual support for your locations to provide consultation or to communicate with homebound patients?

TW

Our communications capabilities in the mobile emergency department were very limited. I did make some phone calls (for example, to help manage a patient with a history of pre-eclampsia and to consult on pregnant women experiencing complicated pregnancies), but I wouldn't say we used telemedicine in the traditional sense. We really were cut off from the outside for some time.

KC

We do use telemedicine in our general population shelters, and we expect them to be able to care for individuals to include access and functional needs. Shelters are supplied with oxygen and can power electricity dependent equipment. We usually put a public health nurse or EMS strike team in place to oversee those residents, and we have a statewide telemedicine contract that can be used as needed. We also allow referrals by telemedicine into the medical support shelter if they feel like that individual's health is likely to decline if they don't have further medical care. We use telemedicine consults to help us get patients into a location where we can stabilize them, but we don't necessarily want them to go to the hospital if they don't have an acute need.

LD

Because we had accommodations for family members in our shelter, that also helped stabilize some of our patients, particularly older patients who experienced more stress during the response.

JH

How can we ensure enough staff are left at local hospitals while simultaneously providing the right mix to medical shelters?

LD

We do need to balance pulling staff resources from the health system at large. We tried to be thoughtful in how we engaged the staff (emotionally and professionally) to provide them with new experiences. Some had never done charge or worked logistics or management before, and they learned a lot in a small timeframe.

LF

Another unique aspect of this situation was our patients' loss of property. Discharge planning is always a challenge; for this deployment, we had to be particularly creative. We began planning before we even took the patients. These discharges were made possible because we had physical therapists and case managers who knew how to tap into the resources in the area. They used their network connections in nearby areas to help rehome or get patients to assisted living facilities upon discharge.

TW

If a patient can't go to a general population shelter, they will go to the emergency department (ED). Without the SMSS's, the EDs would have been overwhelmed. Also, if a hospital doesn't have a place to discharge patients to, they're going to come back to the ED. So without the SMSS's, a lot of those area EDs probably would have ceased to function because they would have been full of patients who couldn't leave.

LD

Some of our lessons learned include the importance of fostering partnerships. With communications being down and the uncertainty of the effects of a hurricane on a mountain region, having these partners to rely on was reassuring. Baptists on Mission, for example, had such a broad community reach and they were very willing to help us network, which was a great example of partnership. We did not have much time to do outreach, but someone from the mission might reach out to a pastor in a nearby mountain church who helped us figure out how we could help. We had this wonderful shelter, an army of people and virtually no patients for a brief period of time. As the word got around (and it was spread by a local, trusted source), we started getting more and more patients. We will incorporate this into future planning.

LF

Another lesson we learned was how important it is to be flexible and resilient. We don't know if we are going to have 1 or 100 patients, but we were content with what we had, and our goal is to be support people in their greatest time of need.

Staffing these shelters is a full-time job. People were calling in to see what they could do to help, and this needed our whole team, including leadership, to coordinate who was coming next and what they were coming in for.

JH

How did you train team members before this deployment?

LF

Laura and I both have trained for many years, and extensively with our team. This time, our team had a variety of experience, probably due in part to the large scale of the incident. It is just so important to get people involved and trained in the same approach before a disaster; it helps the process flow more efficiently when you're in the actual shelter. This was another lesson we learned during the Helene response.

KC

In 2022, we put our orientation for the state medical response system online. We used to hold a two-day in-person only class which included us setting up a Western shelter. There previously was not a lot of interest in this format, so we changed it to be more accessible. Now it is about an hour and a half long and online. During the Helene response, if you were not previously established with one of our state medical response teams, you had to take that course and do some basic training. We had more than 500 individuals from our healthcare system across the state take that training in the first three weeks of the response.

The course briefly covers topics like incident command, how to complete an activity log, how to physically take care of yourself, and how to pack for deployments. We also held live webinars for new staff before they deployed to the operational sites to prepare them for working in an austere environment. We are currently building out this process and creating several short YouTube videos based on the most common questions we received during the Helene response.

LF

Last summer, Kimberly had us come together, stand up a simulation shelter, and network. I believe that that was instrumental in the success of our response to Helene. Kimberly, can you explain a little bit more about that exercise?

KC

Every year we try to do a full-scale exercise (FSE) for our team. Last year, we received a Medical Reserve Corps (MRC) STTRONG grant and wanted to include our MRC units and SMATs in this exercise. This exercise went beyond our usual FSE. We took over a Boy Scout camp in the middle of North Carolina and set up a mobile emergency room, state medical support shelter, and an EOC. We set up our patient transportation team and brought in ambulances and ambulance buses. Students from community colleges served as patients and went to these locations, presenting with different needs. We had about 300 injects and it was technically a two-day event.

It was a fantastic opportunity for all, and our rock stars get to show up and provide some real-world experience, helping us train, plan, and exercise appropriately.

During the Helene response, we had the same teams and team members in place that we had in the prior FSE. I remember sitting in the shelter in the middle of the hurricane and looking around and realizing just how instrumental that training was for all of us.

JH

How did you handle the record keeping process?

KC

We relied on paper. This was one of our biggest challenges. We have a plan in place to move to electronic record keeping and tested it during the exercise. This storm showed us that we may never get to electronic record keeping, due in part to the significant communications/IT challenges we encountered. We will always have a paper backup regardless.

TW

Even in the east, you get isolated quickly. I heard someone refer to this storm as a "hurri-quake." We lost all infrastructure communication-wise. Even the satellites were unreliable.

JH

Can you think of any other lessons you would like to share, such as improvements that would have made the staff experience a bit better, or working in relatively rural areas?

LF

Staff quarters are always interesting and different. Depending on the number of staff we have and what the different requirements are, you have to be willing to sleep on ground mats or cots, but this generally improves over time. At one point in time during the Helene response, there were a lot of staff. We only had one bathroom at the camp, which was a little tight. We did have enough shower stalls. Once we had a solid count of team members and brought the sleep trailers in, that was helpful. a little tight, but we had enough shower stalls.

The location was ideal. The church had a full kitchen and cooked for us; I think we all came home 10 pounds heavier, which is certainly not the norm in these situations!

TW

One difference we noted in our shelter, which was in a relatively rural area, was that there were a lot of groups with differing views of all levels of government. This required us to do different and significantly more planning and outreach than we have in past events.

Recovering from a devastating natural disaster is difficult enough. In this article, we learn how Hurricane Helene flooded mountainous, unstable terrain; affected every aspect of infrastructure; and challenged responders' access to survivors and survivors' access to care. Thankfully, relationships across NC were built during exercises and other preparedness activities prior to the storm, contributing to a more efficient, successful response.