Speaker Series: Lee Health Response to Hurricane Ian Transcript

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Welcome to the ASPR TRACIE Speaker Series Healthcare System Preparedness Considerations. This collection of brief presentations highlights emerging clinical, operational, and logistical practices among healthcare facilities across the country. View the other presentations in the speaker series, linked on the first slide of this presentation.

In this video, we will hear from David Kistel, Vice President and Chief Facilities Executive at Lee Health in Lee County, Florida. Dave will be discussing their health system's response to Hurricane Ian. Dave?

Dave Kistel (DK)

Thank you very much, and I appreciate the opportunity to share our experience with everyone.

We're going to be talking about Hurricane Ian and the impact it had on southwest Florida. Then particularly, the things that we learned with the impact to over 100 of our facilities within Lee County. Next.

This is a kind of a little backdrop on the intensity of the storm. This was a 150 mile an hour storm when it made landfall, close to a Category five. This was a very slow-moving storm and that was part of the significant impact it made to our area. We experienced on the Barrier Islands, Fort Myers Beach, Sanibel, Captiva, Estero, in the neighborhood of 10 to 15 feet of water storm surge.

We had 146 lives lost in Lee County, and, of course, in power loss in the State of Florida, over two point four million.

Communication became a real challenge with the loss of over 1100 cell towers, due to wind storm outages and/or utility failures. An estimated insured loss of $40-67 billion, and that could be growing as time moves forward. Next.

One of the things I want to talk about is, when we think about Florida, and we think about health care, we do have risk plans in place, and we've had these in place since I've been here since 1985.

We learned a lot from Hurricane Andrew that hit the State of Florida in 1992, and we have a pretty thorough checklist of things that we do in preparation of the storm. And I'll just walk through a few, a few of those. Obviously, fuel for our generators is extremely critical.

We have backup generators at all of our acute care hospitals, but we also have backup generators and portable generators for our growing outpatient facilities. Those become very, very important post-storm. Without your outpatient facilities, people tend to overcrowd your emergency room, so we make sure that all of our generators, whether they're on the acute care side or the outpatient side, we have plenty of fuel. We have fuel on stand-by.

We also bring in supplies. We bring in backup water. So, we have a large stocked supply of bottled drinking water in all of our acute care hospitals. We also have storm water reservoir

holding tanks at our campuses. We can fill those tanks up anywhere from 10,000 to 15,000 gallons ahead of the storm, so that we have that to help supplement any short-term water needs that we would need at the facilities.

Prior to the storm, we have found it's very, very important to have mitigation materials within the facility located for any type of storm damage that happens during the storm, and this would be to support any window breaches, water leaks, roof leaks, door breeches, anything like that. Another important thing to have is equipment that actually pulls the water out of the carpet: water extractors. We make sure that we have those located around the campuses as well.

Prior to the hurricane, three days out, all construction work at the campus, campuses are shut down. We walk all of our sites, all of our facilities starting at the roofs, making sure that there is no—nothing on the roofs, no loose debris that could fly off and potentially go through any of our patient windows. So the roofs are cleaned, the sites are secured, all the dumpsters are emptied.

We will go through a pre-check with all of our generators. In most cases all of our hospitals are N2. We generally have two extra generators in spare on our campuses. We have found, over a period of time, post-storm power has always been a number one problem, so we have the capacity to stand alone while the utilities are trying to bring the services back online. And then we have also expanded our fuel capacity. In some cases, we have dual fuel generators, where we have gas and diesel fuel, that helps us with our—extend our runtime.

We began, and we have communications prior to the storm. We will reach out five days before the storm, and start entering discussions with all of our key partners, all of our vendors, regarding food, again water, supplies, linen. All of those things are identified. We have an emergency list of things. Those are wrapped up and sent to us that the challenge we have is that when the wind hits a 45 mile an hour level, the roads basically are shut down and people are not, people are not on the road. So it's very important to get all those supplies early and to your campuses.

At the same time, we start three days out. We begin having discussions to activate our incident command structure. It is based on a HICS (Hospital Incident Command System) outline. And then the central command, we have a central command for the system, and then we have individual centers at each acute care hospital.

Each hospital then is able to take care of its unique, individual, local items, and then the Command Center for the system mobilizes and manages the big issues and provides support to each of the hospitals and to the offsite campuses. Next.

Relative to Hurricane Ian, we had $12 million to $15 million in the damage to all of our Lee Health facilities. We have approximately 4.5 million square foot of facilities. About 3.5 of that is our acute care campuses. I would say one of the benefits that we've had over the many years a couple of our facilities were designed and built under the New Florida Building code so the exterior of the buildings, the windows and the roofs were designed to support a wind impact of what we saw with Ian, but some of our older facilities dating back to the fifties were not built to the same code.

So, what we actually saw was that the building codes, and in 1992, after Hurricane Andrew, there were, like, over 400 building codes in the state of Florida. The state of Florida got together and in 2002, adopted the Florida Building Code. And, of course, every three years, that is

updated. But what you started to see was the expansion of resiliency in the Building Code, which led to structural resiliency in the building. The structure, the skin, the windows, the roofs, and what we found is that the newer the buildings, more compliant with the current code, certainly saw a lot less damage, or minimal damage, relative to the storm.

Where we saw the impacts were going back to some of the older buildings, where they were not designed to that standard, and we had not been able to harden those areas or those buildings, That's where we saw the most damage. Next.

So, if I was going to describe for you kind of the major categories, first, I would talk about power. And, again, going back to our experience with many hurricanes, one of our strengths are, is that we have all the generator capacity required, then some for our hospitals.

And we've also added that to our, some of our critical outpatient facilities in when the power utilities went down for the hurricane. Our backup generators ramp flawlessly and we experienced no issues until normal power was brought back and in some cases, that was a few days. So, we were standing alone at our hospitals until we had had power brought back, but again power did not, there was no issue there.

Rooftops. Again, three buildings with older roofs had some significant damage, but there's really minimal damage to the new buildings, new roofs, and also when we have the chance to replace existing roofs, we've gone to a multi-ply, single-ply, mopped down roof deck. That has held up really well in previous storms, and so that has been kind of our standard that we're using there and that that proved to be successful.

In most cases, windows, drywall, a lot of our hospitals have been upgraded and incorporated the new impact resistant windows. In some of the facilities where we did not have window upgrades, we, we've tried to go back and put some type of exterior shuddering on the building. And some of the older buildings we did have some leak around the windows. We only had one window at one hospital. It was the original 1960 window that actually had an impact resistant—it was not an impact resistant and something literally flew through and broke the window.

Other than that, in most cases, we saw some leaks around the perimeter of the window itself. But the water intrusion was fairly minimal, and we were able to respond very quickly during the storm and mitigate that.

The oldest hospital, that we have, the medical office building, is a combination medical office building and it also has three floors of health care occupancy. The elevator machine room on the roof, the exterior wall failed in the storm. We had, the impact of the rain and water came into the machine room and literally shut down those three elevators. So we had one elevator had a separate machine room and it was not damaged. But we lost three, that was a challenge because when we, after the storm, we had had patients in these areas and we had to use the one elevator that was still operational, but working very quickly with our elevator contractors we were able to get a couple of the elevators back temporarily after about two weeks and we're waiting for the final equipment to come back in. So that exterior medical office building that is being redesigned the elevator machine room is being redesigned to support a much higher level of wind load. Next.

So, people asked me, you know, what was your biggest challenge in this storm? And it really came down to losing water pressure. We have four acute care campuses. One is within the city of Cape Coral. They have their own utility supporting this facility. We have the city of Fort Myers, Lee Memorial Hospital. And then, and that's the City Fort Myers Utilities. We have Gulf Coast Medical Center, and Health Park Medical Center, which includes the Golisano Children's Hospital that is supported from Lee County Utilities.

So, during the storm, all of the utilities were impacted. And in some ways, impacted because you had leaks in their waterlines at multiple locations. And utility lines were not able to hold pressure. Thereby, it dropped the water pressure across all of our hospitals.
In fact, at three of our hospitals, we lost, we had zero water pressure. At one of the hospitals city Fort Myers we had low water pressure, about 10 PSI. This becomes a significant problem. We do have backup water for drinking. And we do have some water for supporting critical functions, but we had to go into rationing.

In the middle, like I said, this was a slow moving storm, so we're getting reports that we lost water, but we don't know what that means in the community. Why did we lose water? What's the impact at the infrastructure? Is this something that can be fixed, or is this something that's going to require, you know, weeks or months to get taken care of?

In the first 72 hours, we were identifying these issues, and we're trying to work with emergency operations centers to get the right people on the line to find out what the status is. And you can imagine, at that period of time, the storm is significant, wind over, you know, 130-140 miles an hour. Nobody is going out into the community. So, so we put in place, things that would support us in the short term.

Number one, we had no wet fire suppression protection in our hospitals because we had no water. We had to go into an immediate fire watch in those facilities, and we had our facilities team, our public safety teams, environmental safety folks at those campuses, and we have a well-defined fire watch plan. And so we, we've put that in place for the benefit and protection of our staff and patients.

We had no water for flushing toilets. Other than we had water that we kept at capacity to support this. So we had to go to a reduction of number of toilets that would be in use. And we would be, we were bringing water to the various restrooms during this outage.

The biggest challenge is that all of the hospitals and the cooling systems are supported through chillers and cooling towers. Without water for the condenser water system, which runs through the cooling tower, the hospital would be in immediate jeopardy, because the building would start heating up if we were not able to chill it. So, we had some emergency preparations in place. We had some, in some cases, some hard pipes, and other cases we had soft hoses that ran out to our retention lakes around the facilities. We were able to pull water from the retention lakes. We also had a backup well at one of our old hospitals. So we were able to take the water from the retention and the wells. We worked with our water treatment vendors to make sure that we had enough biocides to inject into that water before it went into the condenser water system. So by doing that, we use that backup water to keep the hospitals cool.

And that was a critical element to keeping the hospitals, at least, running during the storm.

So, you know, as the water pressure, across the facilities went down, it really, again, it became a problem. It became our number one priority to identify the outage and duration that we were going to be faced with, because we did not have a long term solution like we did for the generators. Next.

So, again, I talked about this, and this kinda gives you a little bit more detail. So, we had provisions, in place in the event of an emergency we understood that that cooling is extremely critical and so we had the means and the services run to tap into retention ponds at three of our facilities.

Cape Coral Hospital, we ran a giant hose to the retention pond Gulf Coast we tapped into the pond that fed the irrigation system. Health Park Medical Center, we set up a pump in a storm drain to pull water out of. And then Lee Memorial, we had an existing well. So, all of these became critical, important water sources for condenser water, and again, this water did not go directly in without being treated with the biocide and we worked out with our water treatment company. Next.

So, this was all going on and we needed to come up with some type of longer solution for potable water. We had to get this stabilized because we basically we're running out of our temporary water bladder water, we were rationing water to the facility bathrooms.

And so it was becoming a challenge, we worked directly with the state emergency operations center, told them that our number-one priority was getting water service and trucks down here to tap into our domestic water potable system.

So, working with them, it allowed us the opportunity. We had a fleet of trucks come down. They hooked up to our system and it back-flowed into our potable water system so it really assisted and helped with the toilet flushing, the hand-washing. And this was water, these trucks were, there were several trucks as one would, would empty, another one would hook up. They would go down to south Lee County, to the Bonita community utilities, which was not impacted by the storm, and they basically that the water was and their trucks were filled up, and they came back to the site so they could keep us filled up with water.

So, that was happening at Health Park Medical Center. It was happening with the Golisano Children's Hospital. It was happening at Gulf Coast Hospital, and also with Cape Coral Hospital.

So at this time, we started—we had communication with all of our utility partners. They were doing assessments. The hospitals were their number one priority. So we received assessments from each of these entities to assist and help us with how long we would be out of fire sprinkler water. So, none of these issues basically resolved our wet fire sprinkler system. Next.

So this caused a problem with, with the state of Florida ACHA (Agency for Health Care Administration) who is in charge of the oversight and licensure of hospitals. There was no clear path to utility full functionality from Lee County Utilities. They were still trying to understand what the breach was.

They enacted a requirement to start an evacuation of Health Park and Golisano Children's Hospital and also Gulf Coast Medical Center.

Cape Coral Hospital. There, there was some discussion with the city utilities, and they were working multiple shifts 24 hours a day to try to get us back online. Concurrent with these

discussions with the other hospitals. And also city of Fort Myers, they had 10 PSI, but they were working on a solution to get water back.

So the state gave us a timeline in which to either get connected, or water at Cape Coral and water in the city of Fort Myers at an acceptable pressure, which really was 20 PSI, which would support our fire suppression system or we would be asked to evacuate those hospitals.

So we worked through the night, through the day. We were actually 10 minutes away from the call with the state and we were able to hook Cape Coral Hospital back in the city of Cape. The City of Fort Myers was able to get us on 22 PSI, sustained at Lee Memorial Hospital. So those two hospitals averted evacuation.

Then we were back in business there. The other two hospitals, we were asked to go ahead and evacuate, and we did so. Next.

So you can see it's quite impactful, the Golisano Children's Hospital. It was an orderly evacuation. We had planned evacuations. We had a few years back, we had closed down Southwest Regional Medical Center and moved that hospital over to Gulf Coast Hospital. So we used that opportunity as we shut that hospital down and we moved all the patients and staff over to the new hospital. We used that as an opportunity, as an emergency preparation drill. So we used the county, EMS, the ambulances, the helicopters, and we learned a lot from that. And I can say that that helped prepare us for the moment that we had to began evacuating patients out of Golisano Children's Hospital and Health Park. And this took, we evacuated 67 NICU babies in less than 24 hours, and there was no one single hospital that could take this number of babies in the state of Florida.

So these babies were being transferred via different modes, whether it's helicopter or ground transportation, around the state. Then at one point we have two helicopter pads. One time, we actually had to create another space for three. We had multiple choppers coming in at the same time, trying to help us with the evacuations.

And then of course the response around the state was phenomenal. All of the other hospitals worked with us also with the Florida Hospital Association, also with the state of emergency operations in Tallahassee. Everyone worked well together, and we were able to move patients out very quickly.

One of the things that we found as we were in the middle of this evacuation, the Lee County Utilities, the reason they had no water pressure was that they had an 18 inch line that supported our hospitals, but also supported the Barrier Islands, Sanibel, and Fort Myers Beach. That 18-inch line was breached. So, as they were pulling water and pumping it to their constituents and the hospital, there was no water pressure being held at the end of the line. So they found this issue.

The challenge they had was, there was so much water from the storm surge that the location of the valve to shut this system off was actually 10 feet underwater. Normally it was exposed, you would drive up to it in a vehicle and shut the valve off. It was 10 foot deep underwater, so they had to get a dive crew out and go down and turn the valve off.

Once they did that, and then they started to get out into the community and find out where they could shut down other lines to open up the line to the hospital. This happened fairly quickly. So,

within, probably 18 to 24 hours from the beginning of this evacuation, we were stabilizing and we're starting to get water back.

And so, because of that, we were able to halt the evacuation of patients that had not left, stabilize, and then, over a period of time, we were able to start admitting patients back to the hospitals that we were discharging from. And this was, so very important to the community, because you can imagine, at this point in time, after the hurricane, there were so many stories of people who had stayed, who were injured. And it was very important to the community that the hospitals were there, they were open, and they were available to treat the patients. Next.

And again, this is a kind of a recap of the transfer of 416 patients transferred over five days to 50 plus hospitals. So it was a monumental effort, required the involvement of so many agencies, so many hospitals, so many employees, but we had no incidents with those transfers. People did their job very well and very calmly. And like I said, once we were able to transfer these patients out, the utilities, specifically Lee County Utilities worked diligently to get our, our water supply back, get our fire suppression systems back turned on.

So, this was a fast transfer, worked well, but it was in about five days, we were able to take patients back on at our facilities. Next.

This is an indication of the storm surge. This is Health Park Medical Center. This is about five miles from the Gulf of Mexico, and the storm surge out there was somewhere neighborhood of 15 foot. This site, the finished floor of the main hospital is 10 foot.

And we had, you can see the parking lot. The parking lot was obviously lower, and you can see some of those surrounding areas, was lower than the finished floor of the hospital. So, a lot of water in the surrounding areas, and we were the high point, there were some buildings adjacent to us that were nine foot, if any floor elevation, and, and they had water on the first floor.

So we did not have water on our first floor, but it did impact the site significantly, we lost about 500 cars. And the other issue was that after the storm, the streets leading to the hospital, and of course, the parking lots were all underwater, so that really created a problem for people trying to get to the hospital, or for any clinical support or service. It also created some challenges early on with evacuations, but the water subsided pretty quickly. And so we were able to start getting people to the hospital and start evacuating. Next.

Again, this is just a picture on your left. This is, we're seeing the wind coming in by the storm, and then to the right, you can see the, the storm surge that. And again, the challenge with this storm, unlike Hurricane Charley, Hurricane Charley was a category four, and it came through in a similar location, maybe just a tad to the north. But it was a very, very fast moving storm.

This storm, on the other hand, was very slow moving, so the winds and storm surge really had the chance to batter and impact the Barrier Islands and then inland. Next.

Again, this is just another picture showing on the left side. This is the, one of the heliport stops here at our hospital. And then you can see to the right, it was under water. And then, on the left side, is the emergency room. And you can see water was, was close to coming in, but it did not breach our emergency room. Next.

This is a picture, again, showing the parking lot in the storm. This was actually taken by a clinician from a patient window, found her car and identified it. And you can imagine this in

itself took us about 7 to 10 days to clear all these automobiles from the parking lots. So that was a challenge and a significant challenge in the community, because thousands of cars were lost in the storm. Next.

As we were waiting for our water trucks to arrive, and as we were close to depleting all of our storage water that we used for flushing toilets, you can see, we went to the lake. The water had resided and we started bringing water in as a secondary means to flush toilets, but that was short-lived because we received the water tanks from the state emergency operations center. So, but it's just an indication of what happens, just shows you how important water is to an institution, a hospital, in various aspects. Next.

This is just a graphic portrayal to show you the impact of the storm surge. This is Fort Myers Beach. And the Shrimping industry you can see in the top, just hundreds of shrimp boats were washed up onto the land. You can see the devastation that the storm surge left behind, now on the Barrier Islands. And what you really notice is that the older buildings that were constructed prior to 2002 really had significant or catastrophic damage to them. In areas where the homes were constructed to the newer flood elevations and also to the newer building codes, in the most part, those seem to be able to withstand the storm. Next.

This is a couple of our major artery bridges out to the Barrier Islands. On your left is Sanibel Causeway. Sanibel, Captiva is probably one of the most beautiful places in the world. As the storm subsided, we started getting views of what the community looked like, and this really cut off the Sanibel Causeway to all the people that lived in Sanibel and the Barrier Islands. On your left, you can see that it was a major damage. And then, to the right, Matlacha Pine Island, same thing. The island of Pine Island was cut off. They lost their bridge as well.

So there was, there was no shortness on damages, infrastructure, power, water, in some cases sewer systems, and of course, thousands of people without homes to go to. So significantly devastating. Also for us in the hospital staff, we have a lot of our staff that reside in some of these areas. Just to identify and locate where staff was, was extremely important thing to us. And we were contacting staff, we were doing everything we could to make sure that, that people were safe or they had a place that they could go to.

So post-storm, we were working diligently on all facility challenges, the water challenges, and bringing our systems and facilities backup into operation. But at the same time, we're also trying to understand staff, what, what happened to them, their families, their homes, and the availability of services. That was a significant issue for us, as well. Next.

So some of the positive things. I would say that our buildings overall performed very well, other than a few of our outpatient facilities that were in close proximity to the Barrier Islands that were impacted by the storm surge. None of our hospitals from a water intrusion and/or a wind component took a knockout punch.

So, our facilities withstood close to a category five hurricane. I'd say the positive things are the wind mitigation things that we've done over the years, whether it's replacing windows, whether it's hardening areas with shutters, or maybe replacing building skins, I think that was really helpful. Also, adding emergency generator capacity at our campuses and our storage capacity for fuel was extremely critical. Power, like I said, was never an issue.

Again, the issue we had and we faced with this storm, was the water. So, one of the things that we are moving forward with is how can we maintain critical operations that are water dependent? And so, a week after the storm hit, we applied for emergency well permits for acute care hospital sites. In a short period of time, we were granted that, from all the permitting entities. They understood why this was so important to our future in mitigation of storms.

We really need a reliable second secondary potable water source if the building is standing and we have power, but we don't have water or fire protection, it's a weak link and the state's not going to allow us to stay in operation. So, we're moving forward with the secondary source for potable water, and also for our emergency fire suppression systems.

The reliable secondary condenser water source for building cooling, we did have a response to that. It was an emergency. We used retention ponds except for one hospital. We had an old well, we were able to use that, but we'll be able to use these wells as well for the secondary condenser water source for the building cooling.

The building codes that are in place in the state of Florida have come a long way, but in our newer buildings that have been recently completed and turned over, the Golisano Children's Hospital performed extremely well, very minor impacts and damages to those facilities.

Also, Gulf Coast Medical Center, a fairly new completed facility, very few issues. One of the things that we did, though, after the storm, we have continuing service contracts with structural engineers, mechanical, electrical engineers, fire protection engineers, civil engineers.

So, we brought our consultants in specifically structured to review all of our existing hospitals, to make sure that they were exposed to a significant wind event, so we wanted to make sure that there was nothing critical, that we may have missed with the storm, and there really wasn't, but there were a few things that needed to be repaired. So they quickly provided us design drawings so that we can make the repair.

So really important to have secondary consultants available to bring in after a storm like this, who can help you resolve any type of issues. But we do see that putting wells in is going to be critical, going into the future, and supporting our continued mitigation efforts to help us stand alone in storms.

So, with that, that's a quite an overview, but I just wanted to make sure you had an opportunity to hear our story, and we appreciate it.

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Great, thank you so much, Dave, for that great presentation, and really providing these tangible examples and considerations that others can use in their planning efforts. Well, that concludes this presentation. Please feel free to reach out to ASPR TRACIE with questions for any of our speakers in this series. Thank you.