After The Flood: Surviving Hurricane Juan

APRÈS L'INONDATION: SURVIVRE À L'OURAGAN JUAN

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RÉSUMÉ

Le centre universitaire des sciences de la santé *Capital Health* est le plus grand district de la santé intégré au Canada atlantique. Il fournit des services médicaux tertiaires aux Canadiens de l'Atlantique ainsi qu'à 40 pour cent de la population de la Nouvelle-Écosse. *Capital Health* comprend neuf établissements médicaux, un desquels s'agit du Queen Elizabeth Health Sciences Centre. Ce dernier est le plus grand centre universitaire des sciences de la santé pour adultes au Canada atlantique; il compte 10 bâtiments sur deux sites, 8500 employés et 1075 lits.

Le Queen Elizabeth Health Sciences Centre a été créé en 1996 lors de la fusion de six hôpitaux : Victoria General, Halifax Infirmary, Abbie J. Lane Memorial, Camp Hill Veterans' Memorial, Nova Scotia Rehabilitation Centre et Nova Scotia Cancer Centre. Il y a 33 salles d'opération aux sites Victoria General et Halifax Infirmary; ensemble, à peu près 29 000 procédures chirurgicales y ont lieu chaque année. Les deux hôpitaux se trouvent à environ 5 pâtés de maisons l'un de l'autre.

Cet article traite de la manière dont ces deux établissements ont fait face aux ravages de l'ouragan Juan en septembre 2003.

AFTER THE FLOOD: SURVIVING HURRICANE JUAN

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ABSTRACT

Capital Health is the largest integrated academic health district in Atlantic Canada. It provides tertiary health services to Atlantic Canadians and to 40 per cent of Nova Scotia's population. Capital Health consists of nine facilities, one of which is the Queen Elizabeth II Health Sciences Centre. The QEII is the largest adult academic health centre in Atlantic Canada, occupying 10 buildings on two sites. It employs 8,500 staff and has 1,075 beds.

The QEII was created in 1996 with the merger of the Victoria General (VG), Halifax Infirmary (HI), Abbie J. Lane Memorial, Camp Hill Veterans' Memorial, Nova Scotia Rehabilitation Centre and the Nova Scotia Cancer Centre. There are 33 operating rooms at the HI and VG sites; together about 29,000 operations are performed there each year. The two hospitals are located about five city blocks away from each other.

This article discusses how the two facilities coped after the devastation of Hurricane Juan in September 2003.

WEEK ONE, DAY ONE

Usually we practice evacuations for fire or other types of disasters thinking it will never happen to us. When the people of Halifax, NS, awoke

Surviving Hurricane Juan (cont.)

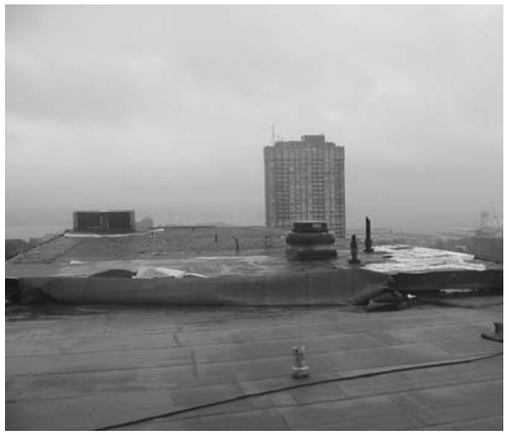

Photo by M. MacLeod

Damage to VG Hospital roof

on September 29, 2003, disaster was a reality. Hurricane Juan had arrived during the night with sustained winds of up to 170 km per hour, leaving devastation in its wake. Power was out across the Halifax Regional Municipality and streets were covered with downed electrical lines and debris.

The staff at the QEII made brave efforts to get to work, some walking as much as 12 to 15 km. Many staff members had to leave damaged homes, cars and property. It was hard to leave their families in the dark, with no telephone service and some of them without water. When the VG staff arrived at work, they were greeted by the sight of their hospital's roof lying in pieces in the parking lot among the fallen trees.

For the first time since the Halifax Explosion, in 1917, Halifax declared a state of emergency. Every single transmission line running into Halifax Regional Municipality (HRM), was knocked out. The QEII was operating on auxiliary power, and all scheduled surgeries were cancelled. The situation was tense, but staff tried to keep the atmosphere light. Between 0600 and 0630, a plant engineer came to the OR to tell staff that the roof was gone and asked them to check for water damage. The OR supply technician checked the ORs and the hallway but found no visible signs of damage. The VG OR staff received a call to book an emergency case.

At about 0800, it began to rain heavily. The patient hadn't arrived yet. The anesthesia staff was getting ready when someone noticed that the emergency-evacuation stairwell was a river of water, and the damage went all the way from the 12th floor down to the fourth floor. Water was beginning to leak into the hallway. On the 11th floor, water was running down the OR lights and walls. The hallway was flooded, as were the storage rooms for sterile medical surgical supplies. Staff started moving everything out of the theatres to alternate emergency-evacuation rooms.

Due to the flooding, the emergency case's operation couldn't be done at the VG site. The ceiling tiles by the OR desk and in another room started to drop. Asbestos exposure became a concern. The Engineering Department ordered everyone to evacuate immediately to the ground floor. The power and ventilation were disconnected to the 10th and 11th floor OR theatres. The charge nurses used the daily staff schedule to account for everyone. The Perioperative director told VG staff members to remain on the ground floor in case they were needed to evacuate patients.

The nursing units from the 3rd to the 11th floors of the A wing of the VG site's Centennial Building were evacuated to different facilities around the city. The VG intensive care unit was moved to the HI site in the post-anesthesia-care-unit overflow area. More than 200 patients were moved out of the VG site by 2100h.

Photo by M. MacLeod

Parts of VG roof in the parking lot

The OR staff wasn't needed to evacuate patients, so they were sent home. That night the VG site's OR staff was asked to report to the HI site for life-or-limb emergencies. The VG staff knew that the HI site could supply instrumentation for most emergencies except urology. All of the instrumentation on the 11th floor was contaminated, but the 10th-floor instrumentation, where urology was located, was fine. The charge nurse made arrangements to send instrumentation and equipment to the HI site for urology. The Sterile Processing Department (SPD) worked through the night reprocessing all of the 11th-floor operating rooms' contaminated instruments. For the rest of the week, emergency life-and-limb surgery for all services was done at the HI site.

WEEK ONE, DAY TWO

QEII staff members were saddened by the loss of their colleague, John Rossiter, a paramedic who died instantly when a tree fell on the ambulance he was driving during the storm. VG staff began to make plans for how they would carry on post-disaster. Each day started with a meeting of department chiefs, managers, and the director of Perioperative in order to decide priority cases, modify OR schedules and address concerns.

The SPD manager and Infection Control manager did rounds to inspect the damage to instrumentation and supplies at the VG site. Most of the medical surgical sterile supplies were contaminated, and OR supply technicians had to inventory them before they could be given to insurance adjusters. The VG staff had to move equipment to the HI site. VG nursing staff did this in the dark with flashlights because the power and ventilation weren't working. Necessary equipment was identified and prepared for transportation. Biomedical Engineering at both sites inspected the equipment upon departure and arrival.

A truck was assigned to move equipment, supplies and instruments. The resource nurses in each service from the VG made lists of necessary instrument sets to do emergency

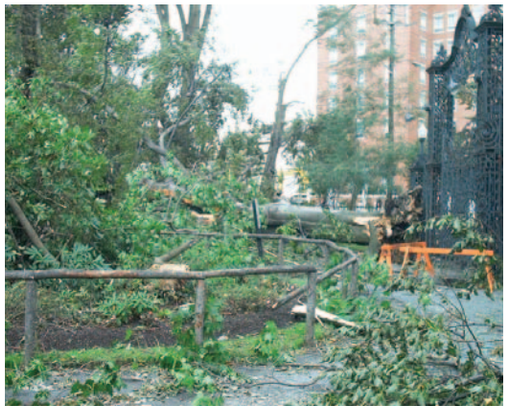

Photo by M. MacLeod

Hundred year old trees knocked to the ground in Public Gardens, downtown Halifax

cases. SPD staff packed carts to transport the sets to the HI. A hospital-wide deployment centre was set up. Daily planning was done to deploy extra staff to areas that were short-staffed or that needed assistance. This process continued until all services moved back to the VG site.

VG site nursing staff needed to be oriented to the HI's 19 operating theatres. There are many differences between the two facilities. For example, the HI works with a sterile core and a case-cart system, while the VG nursing staff picks cases from a sterile room and doesn't have a sterile corridor. The HI nurse educator spent most of the second day helping VG staff become familiar with the HI's physical layout as well as the case-cart system.

WEEK ONE, DAY THREE

HRM residents were still cleaning up and the power remained off in most areas. It was decided that only emergency surgeries would be performed. Engineering and maintenance reports from the repairs at the VG site's ORs were positive, and staff looked forward to returning there the following week. The HI educator continued to orientate staff that had been off or deployed to other areas.

The damp smell in the VG site's ORs was troubling because there was no ventilation, and dampness is an ideal breeding ground for

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mould. Maintenance installed large industrial blowers to dry the area, and Maritime Testing checked the air quality. The results indicated that there were no asbestos or other fibre concentrations in the air. Daily newsletters were printed to inform staff of the damage, any repairs and services such as the use of showers for staff with no water or heat at home. Repairs to the VG site Centennial A wing roof began.

WEEK ONE, DAYS FOUR AND FIVE

An OR newsletter was distributed telling staff about changes in the OR schedule and how processes such as callbacks would work. The OR executive made the decision to resume a limited number of day surgeries at the HI site, a maximum of six cases per service for week two. VG services were assigned specific ORs, which were geographically close, to be run separately from HI services.

VG nursing staff was assigned to SPD to pick cases for the VG services on the case cart because HI site SPD staff members weren't familiar with the VG cases. Daily meetings were held with the charge nurses, OR educators, and health services managers to solve problems at the two sites. An HI nurse was assigned to each VG site's OR theatre to locate supplies and help the VG staff become comfortable in their new environment.

WEEK TWO

Engineering Services was planning to complete a damage assessment in the VG site's ORs and patient floors by midweek. The roof at the VG site's A wing was repaired. The ORs appeared to be dry. Infection Control was concerned about the growth of mould and moisture behind the walls.

On Tuesday limits were set on the number of same-day-admit patients per service that could be handled due to the decreased number of beds. Another concern was that most patients were still without power, telephone or water service, so they couldn't be sent home or contacted. Eight OR theatres were to be functioning at the HI. Nursing staff inspected sterile and non-sterile items stored in the VG site's ORs for water damage.

Nursing staff was asked by Engineering Services to remove everything from the VG theatres in order to repair the plaster, paint and ceiling tiles. These repairs were finished by the end of the second week. Maritime Testing, which was called back to check the dampness, discovered high levels of water behind some walls. Infection Control was concerned about aspergillus, mould and mildew. The OR committee called an emergency meeting to address this. The Infection Control physician and nurse discussed their concerns about opening the ORs with a risk of aspergillus spores in the air. The OR committee accepted infection control recommendations and all of the openings around lights and vents in the OR theatre were sealed to prevent spores from escaping. As added protection an anti-microbial shield was applied to all OR surfaces. This shield is designed to provide control of fungus, bacteria and other single celled organisms and it chemically alters building surfaces to provide long-term protection from regrowth. It is a very thin, clear liquid that can be invisibly applied (sprayed) to most surfaces in buildings including painted drywall, concrete, carpets, HVAC components and furnishings.

The OR Committee suggested the services resume at a 75% activity level at the HI site during week three, using an Ophthalmology theatre at the VG site for general surgery. This meant moving some equipment and instrumentation back to the VG site in a short period of time. The sterile-processing liaison nurse and educator prepared the Ophthalmology suite for general surgery.

WEEK THREE

During the weekend of October 11, 2003, all VG site ORs were resealed using 450 tubes of caulking. An anti-bacterial shield was sprayed on and air samples were taken. Infection Control gave permission to put the VG

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equipment, supplies and furniture in all OR theatres but instructed staff not to move in any patients until the results of the air testing arrived on Oct. 17. If the results were negative, the ORs were expected to operate at 100% on Oct. 20. If the results were positive, a long-term plan was to be discussed.

The VG site's OR manager, VG staff and HI staff who hadn't been assigned to theatres worked together to prepare the VG's 16 OR theatres by cleaning the cupboards and returning equipment. Nurses worked in teams of two to clean and return furniture, set up the rooms and restock supplies. This was done by mid-week. A plan was developed to move sterile supplies, instruments and equipment from the HI site and Ophthalmology back to the VG OR's.

At 1200, on October 17, Infection Control had the air-quality test results. They showed no mould growth, so the VG OR was able to accept patients. The first van was loaded and equipment transferred by 1230. The VG Perioperative educator organized the move back to the VG, deciding which equipment and instruments could move in a particular order because surgeries were still being done at the HI site. She also arranged for Biomedical Engineering to check the equipment after its return, because it would be required for October 20 when surgeries resumed at 100%.

The charge nurses discussed with the VG educator which items were needed for the scheduled cases and what could be moved when. A designated patient attendant, OR supplies technicians, health services manager and two nursing staff met the van at the VG site and delivered carts, equipment and instrumentation. What took one week to move to the other site was returned in 12 hours. Biomedical Engineering worked until after midnight to ensure that equipment needed for Monday morning was both safe and functional.

At 1800 on October 17, the last case was completed at the HI site and the final load was delivered. The VG evening staff members moved back with the last load. Emergency cases were ready to be booked at the VG site.

WEEK FOUR

The ORs at both sites resumed normal activity. The number of booked surgeries that had been cancelled due to Juan was 370 out of 437 scheduled cases. The OR Committee felt that, with its current resources, the system couldn't catch up with all the cases that were cancelled. The only option was to rebook cancelled surgeries and consequently increase the surgical wait lists.

Normally in a hurricane, flood or tornado, the health care system is there to help victims. During Hurricane Juan, the health care system was a victim, which radically affected its ability to deliver patient-care services to Atlantic Canadians.

LESSONS LEARNED

- Verbal and written communication is vital and should be repeated frequently. Any changes should be relayed to staff as soon as possible;
- Leaders need to be visible and to offer frequent support;
- Everyone needs to feel useful. Assign and delegate jobs accordingly. Staff resentment at being relocated was heightened by the fact that there was not enough work for everyone;
- People should be selected and designated at each site to be responsible for sending and receiving equipment. Ensure they receive direct and accurate communication;

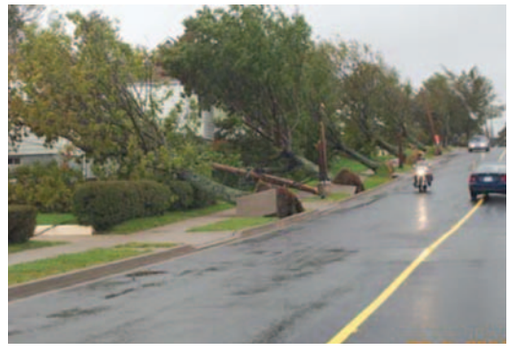

Photo by M. MacLeod

Entire streets of trees were down in many areas inlcluding this suburb of Halifax

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- Biomedical Engineering needs to be informed directly of equipment priorities in order to ensure priority checks are done as quickly as possible;
- An inventory should be kept to document equipment and instruments along with their current location;
- Priority lists should be quickly developed to document equipment and instrumentation requirements. Resource nurses should identify these lists for various services;
- Regular management visits to the damaged site will help ensure repair and maintenance updates;
- A familiar educator, charge nurse or manager should be appointed to be available to staff, at all times, when they're placed in a new environment;
- A local staff nurse assigned to finding items and getting staff comfortable in the unfamiliar surroundings is very helpful;
- Electrical engineers should regularly communicate with staff to explain the damage and its consequences;
- Staff should be assigned to both sites to work together as one "moving team"; and
- Strong teamwork will strengthen the bonds between two groups and help remind us that regardless of our location we are all part of the same team.

Photo by M. MacLeod

Repair crews working hard to clear the roads and restore power near downtown Halifax

STEPS TAKEN TO DATE:

During Juan, HRM declared a state of emergency and wanted only essential staff to be on the roads. A great deal of time has been taken since Juan, to ensure staff understand that everyone who works in healthcare is considered essential – for example administrative staff can be deployed to answer phones on nursing units;

A toll free phone number has been set up to provide hospital staff with up-to-date, accurate information during an emergency situation;

In recognition of the efforts made, hurricane hero stories were distributed on our intranet site as well as to the local papers;

Halifax and Dartmouth have now established web technology and internal email communication tools;

Display boards for bed status and major event status, providing space for the display of ongoing, changing information, are being considered;

Access to alternate satellite feed for TV coverage or digital access via the internet is being explored to allow for communication to the public about resource changes at the hospital due to an emergency situation;

An emergency contact list of internal and external resources is now available on the web;

A recognized training program is being developed to address the need for a Duty Officer and Duty Administrator in emergency response situations;

The District Emergency Response Center is in the process of being relocated due to the lack of emergency power at its current location.

Leadership in Health Care – Orchestrating Change

LE LEADERSHIP EN SOINS DE SANTÉ – ORCHESTRER LE CHANGEMENT

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RÉSUMÉ

De nos jours les soins de santé sont un orchestre. Les patients arrivent quelques heures avant la chirurgie et partent quelques heures après. Ils arrivent avec une chemise de classement pleine d'information téléchargée et de listes de questions. Ils naviguent des systèmes complexes; ils sont indispensables à la coordination de leurs soins et de leurs propres besoins.

Les fournisseurs des soins de santé sont les sections de l'orchestre – chirurgie, radiographie, soins préopératoires, soins cliniques, cardiologie, et plus encore. De plus, l'âge moyen des travailleurs de la santé nous apprend que la majorité ont reçu leur formation au moment où le système hiérarchique était le plus répandu. Le leadership est fondamental. Nous avons changé de lieu, et les leaders doivent fermer la porte et aller vers l'avant. En tant que leader en soins de santé, comment puis-je aller vers l'avant quand nous vivons une période de changement presque chaotique? Il y a plus d'information disponible au simple clic d'une souris qu'une seule personne ne pourrait comprendre. L'heure actuelle nécessite une vision de l'avenir. Cette vision demande la compréhension. La compréhension exige l'intuition, et l'intuition commence à l'intérieur de soi. Le trajet vers l'avant débute par le trajet vers l'intérieur.

Le leadership est une chanson. Elle commence par l'âme et, avec de la formation, de l'aide et une forte équipe, elle peut être entendue de Helsinki à Vancouver.

LEADERSHIP IN HEALTH CARE – ORCHESTRATING CHANGE

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ABSTRACT:

Today health care is an orchestra. Patients arrive hours before surgery and leave hours afterward. They bring manila folders full of downloaded information and question lists. They maneuver themselves through complex systems; they are instrumental in coordinating their own needs and care.

The health care providers are the sections of the orchestra – surgery, x-ray, pre-op, clinics, cardiology and so on. Furthermore, the average age of the health care worker lands them at having trained directly at the height of the hierarchical system. Leadership is crucial. We have changed venue, and leadership needs to close the door and look forward. As a Health Care leader, how do I move forward at such a time of almost chaotic change? There is more information available with the click of a mouse than any one person could assimilate. These times require vision. Vision takes understanding. Understanding takes insight, and insight begins within. The journey forward starts with the journey within.

Leadership is a song. It starts in the soul and, with training and help and a strong team, it can be heard from Helsinki to Vancouver.

When an Orchestra finishes playing, the final note hangs in the air for a moment, suspended. Then there is the sound of cases gently closing as instruments are put away. There is the leaving of the orchestra and the closing of the door. They will play again in another venue. This metaphor is an image of sound, movement, change and teamwork. It is a metaphor for our work, our culture, and the change of era we are experiencing at this moment in time. It is a metaphor of leadership. We are no longer