



Nebraska Society of Healthcare Engineers

Presentation

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OBJECTIVES

- **Introduction to OMMRS (Background Information)**
- **OMMRS Mission Statement**
- **Event Case Studies**
- **Lessons Learned / Challenges**



Mission Statement

- The mission of the Omaha Metropolitan Medical Response System (OMMRS)/ Healthcare Coalition is to *prepare* the local *medical community* in *partnership* with Public Health, fire, law enforcement, major businesses, government entities and community organizations of the city of Omaha and Surrounding communities for an *integrated* medical response to any disaster, including those that could result from a terrorist attack.



NATIONAL HISTORY

- **The Defense Against Weapons of Mass Destruction Act of 1996 directed the Secretary of Defense to enhance capability and support improvements of response agencies**
- **The Nunn-Lugar-Domenici Amendment to the National Defense Authorization Act for FY 1997 authorized funding for “*medical strike teams,*” and the subsequent development of the MMRS Program**
- **When established there were 125 MMRS jurisdictions**



LOCAL HISTORY

- **1997: DoD in conjunction with the Omaha Fire Department presented two programs one for Hospital Providers and one for Emergency First Responder**
- **Tabletop exercise six months later on a nerve agent released into the ventilation system during a sporting event**
- **AAR indicated three major issues that needed addressed**



Three Major After Actions Items

- **All hospitals with 24/7 ED Coverage should have a Decontamination team**
- **Proper PPE**
- **Training/education on the NBC agents**



LOCAL HISTORY CONTINUED

- **Four agencies were invited to attend: Public Health, Emergency Management, Fire and Police Department.**
- **In 1999 we became more organized and selected chairpersons**
- **Expanded our membership to included other identified agencies**
- **Community plans were assessed and we applied for Federal funding / Received August 2000**



State / Federal programs

Two Federal Programs (MMRS)

Five State Programs (MRS)

**(OMMRS/HPP/HCC covers 7 counties 5 in
Nebraska and 2 in Iowa)**

Twenty Three hospitals

Disaster planning group for Healthcare



Emergency Medical Event General Information

For Optimal Emergency medical response with an event relies on:

- **Functioning communications System**
- **Functioning Information System**
- **Functioning Facility Support Services**

Disruptions may be planned or unplanned

- **Healthcare Services are interrupted with Internal and External failures: Utilities/Electronic Medical Records/compromised Supply chain**
- **Facilities place a high risk significance on Information Technology but they need to have a much broader view**
- **Key healthcare functions that need to be considered for continuity of Operations planning (COOP): Facility infrastructure-utilities (water-electrical-gas-sewer-fuel-medical gas-air handler-heating-air conditioning- ventilation)**



Case Study: (Total Computer Outage)

An event in a healthcare facility will affect almost always all departments.

■ Hospitals are becoming a soft target for hackers.

Recently a hospital had a Cyber Security event due to a ransomware issue.

“Goal is to obtain the contact information of leadership and to send out an official looking e-mail to employees—once opened the system is compromised.”



Total Computer Outage

**All computers were down in all departments
and their outlying facilities**

No computer service for over three weeks

Caused a lot of work to restore

Very costly to re-image computers



Total Computer Outage

- **Could not get information or document in electronic medical records**
- **No record on who was scheduled for OR**
- **Sterilization –processes were not written down--all information was in the computer**
- **No way to communicate with patients on appointments their contact information was not available—all contact information was in the computer**



Total Computer Outage

- **Vendor information in computers not written down**
- **Accounting issues**
- **Medication issues**
- **Needed adequate amount of downtime forms**
- **All computers had to be re-imaged**
Had to prioritize which department computers
would be restored first



Total Computer Outage

Lessons Learned:

- **Need to better educate staff**
- **Review critical components**
- **Needed to evaluate the processes that do need written backup**
- **Needed to have vendor/MOU's contact information written down**
- **More down time forms available**



Case Study: (Planned water Outage)

- **One hospital as a preventative measure planned to replace several water valves which would result in a complete water outage for an extended time frame until the project was completed.**
- **Pre planning was extensive-numerous meetings were conducted with Leadership, Engineering, Security, Safety, Infection control, contractors, stakeholders, and patients and employees given regular updates.**



Planned Water Outage

Each critical department was asked to evaluate their area and mitigate any possible issue

- **Every bathroom checked --porta pots (handicap assessable) were ordered and placed in each area**



Planned Water Outage

- **Water to flush the toilets was evaluated and placed on each unit (3 gallon for each flush) (Toilets were operational but not automatic)**
3,528 Gals. (43%)1,512
- **The water for drinking was evaluated and bottled water placed on all units. 13,104 bottles 16.9 oz (14%)1,872**
- **Hand washing stations (18 gallons)**
- **Portable eye washing units**



Planned Water Outage

- **Fire suppression system was not an issue**
- **Fire watch—Regular rounds**
- **Staff and patient updates**
- **Prepared for possible evacuation**
- **Leaks were being addressed as reported**



Planned Water Outage

- **Strengths:**

- Pre planning --group effort and with primary stakeholders
- Participation in event planning was voluntary but level of ownership contributed to its success
- Patient care mitigated by inpatient staff and care schedules adjusted
- Safety and infection control was maintained
- Incident command worked well
- Engineering maximized the shutdown to complete number of plumbing work orders



Planned Water Outage

- Morale was high—no complaints**
- Labor pool worked well**
- Water staging areas worked well**

Issues:

- Some providers unaware of event**
- Master keys did not open every door**
- Needed on call rosters available in EOC**
- Needed to have emergency approval available for contracts**
- Evacuation planning needs a specific checklist**
- Needed to schedule employees appropriately**
- Needed a plan in place for emergency power shutdown by zone or specific location**



Case Study: Planned Electrical Event

- **Older hospital constructed in the 1970's—
needed an upgrade to all major electrical
distribution equipment Including:**
 - High voltage switch gear
 - Secondary Unit Sub stations
 - transfer switches
 - switchboards
 - panel boards

Project approved: July 2012

Kickoff September 2012

- **Turnover of Facilities Director x 2**
- **Turnover of contacts with local electrical
supplier**



Planned Electrical Event

Failure Modes Effects Analysis (FMEA) completed

- **Divided project into interior and exterior work**
- **Project lead and Contractors Determined possibility of failures/likelihood of occurring/ severity if occurs/ likelihood of detection**
- **Developed Action plans to mitigate risk of failure**



Planned Electrical Outage

- **Numerous meetings with project Lead, contractors, and safety.**
- **Project reviewed using: Preconstruction Risk Assessment (PCRA)**
 - Infection control Risk assessment**
 - Interim Life Safety Measures Risk Assessment**
 - Mitigation plans developed based on Risk Assessments**
- **Communications plan developed (Logo)**
- **Each department to do and an electrical inventory / determined power source (Normal/critical) within next 18 months for each item—contingency plans reviewed**



Planned Electrical Outage

- **Significant error occurred June 2013**
- **All critical power lost for extended time moved to generator power**
- **During steps to move back to utility feeds the Critical ATS switch shorted out**
- **ATS transferred power to utility and tripped both generators and normal breakers feeding ATS**
- **Within 15 minutes power was restored to be fed from the generators**
- **Campus data center which houses several systems programs lost power resulting in a shutdown /IT had to restart programs and recover data.**
- **Web based programs were down across the system (4 hours)**
- **Pharmacy drug dispensing, EMR, Intranet, timekeeping etc all were affected**



Planned Electrical Outage

- **Safety of patients, visitors, staff and contractors was confirmed**
- **Incident Command stood up**
- **Briefing to command staff completed by facilities director and Branch Infrastructure Director**
- **Phasing rotation not correct**
- **Requested Immediate shutdown of circuit to correct phase rotation**
- **Damage to ATS made repairs impossible**
- **New switch ordered but would be 5-7 weeks for delivery**
- **Received a loaner switch from another hospital**
- **Planned outage of 12 hours to remove damaged switch and install the loaner switch once installed all systems back to normal**



Planned Electrical Outage

Hotwash

- **Needed single leader for remainder of project**
- **Remainder Project run by Incident Command**
- **Facility director was Incident Commander**
- **Each outage was reviewed by IC and technical experts with Lead management to answer questions**
- **Developed Incident Action Plan (IAP) and did briefing prior to outage**



Planned Electrical Outage

- **Written communication to end users (72/24/8) hours prior to outage (Consistent)**
- **Go/No go check list developed and was mandatory for each outage**
- **One person assigned to keep all documentation**
- **Risk assessments completed prior to any work**
- **Kept staff informed of work status (area/ risks, contacts etc)**
- **December 2013 project completed –no further issues**



Case Study: Storm Related(May 2011)

- **Joplin: EF 5 Tornado (13.8 miles long-3/4 to 1 mile wide)**
- **8000 structures destroyed**
- **400 business destroyed or severely damaged**
- **18,000 vehicles destroyed or severely damaged**
- **4,500 jobs displaced**
- **161 deaths**



Storm Related

- **Direct hit to St.Johns-Mercy(183 Patients)**
- **Windows and walls blown out**
- **Portions of roof pulled off**
- **Infrastructue severely damaged**
- **Generators destroyed**
- **All communications lost**
- **Water, sprinkers, gas, sewer pipes disrupted**
- **Liquid O2 tanks damaged**
- **Massive debris throughout building**
- **Helicopter and disaster trailer destroyed**



Case Study: Storm Related (August 2011)

- **Hurricane Irene: Johnson Memorial Hospital:
Small Acute care hospital—licensed for 98 beds
and normally staffed for 90**
- **Lost all power and generators**
- **Determined to evacuate 43 floor patients and
5 ER patients**



Hurricane Irene

Strengths:

- **Had done pre storm planning / preparations**
- **Had conducted a recent evacuation plan exercise**
- **Collaborative leadership meetings/ Incident Command and leadership together on decisions**
- **Cooperation and coordination with hospital staff, first responders and regional support**
- **Families of patients notified of evacuation and patient status prior to evacuation**
- **No untoward patient outcomes as result of evacuation**



Hurricane Irene

- **Realization of how dependent hospitals are on power taking for granted (Pixus/med cabinets/ Master key back-up /illumination-could not see once they got into facility more than 30 feet/Phone systems /Patient call system)**

Issues:

- **Failure of backup power generators**
- **Inter hospital communications**
- **Ambulance notification once enroute**



Hurricane Irene

- **No standard process in place for evacuations with area hospitals**
- **Differences on how to move patients down steps between hospital / EMS**
- **Situational awareness to other hospitals**
- **Lack of Mutual Aid Plans**



Challenges

- **Communication**
- **Risk assessments**
- **Lack of plans / Authority**
- **Exercise plans**
- **MOU's**
- **Education of staff**
- **Resources / Funding**



Questions?

■ Contact Information:

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