COVID ONE YEAR LATER

PENNSYLVANIA SOCIETY FOR HEALTH FACILITY ENGINEERING

February 26, 2021

John DiGirolomo

Bill Payne

Richie Stever

CORONAVIRUS DISEASE 2019 (COVID-19)

- On February 11, 2020, the World Health Organization announced an official name for the disease that is causing the 2019 novel coronavirus outbreak. The new name of this disease is coronavirus disease 2019, abbreviated as COVID-19. In COVID-19, 'CO' stands for 'corona,' 'VI' for 'virus,' and 'D' for disease. Formerly, this disease was referred to as "2019 novel coronavirus" or "2019-nCoV."

- Coronaviruses, named for the crown-like spikes on their surfaces, are a large family of viruses that are common in people and many different species of animals, including camels, cattle, cats, and bats. There are many types of human coronaviruses, including some that commonly cause mild upper-respiratory tract illnesses. COVID-19 is a new disease, caused by a novel (or new) coronavirus that has not previously been seen in humans.
- Animal coronaviruses rarely infect people and then spread between people. This occurred with two earlier coronaviruses, MERS-CoV and SARS-CoV.
- SARS-CoV-2 virus is a beta coronavirus, like MERS-CoV and SARS-CoV. All three of these viruses have their origins in bats. The sequences from U.S. patients are similar to the one that China initially posted, suggesting a likely single, recent emergence of this virus from an animal reservoir. However, the exact source of this virus has not been identified.

SOURCE OF THE VIRUS

CONTENT SOURCE: NATIONAL CENTER FOR IMMUNIZATION AND RESPIRATORY DISEASES (NCIRD), DIVISION OF VIRAL DISEASES

HEALTHCARE FACILITIES RESPONSE

- ASHE, the American Society for Healthcare Engineering immediately acted to respond to COVID and the devastation being caused to our healthcare facilities.
- A taskforce was developed to gain and consolidate information about the response to the pandemic.
- The goal was to share information in a timely manner and to learn from each other best practices that were being developed.
- A survey was developed in July of 2020 requesting member's experience

COVID RESPONSE TACTICS SHARING (CRTS)

- The COVID Response Tactics Sharing (CRTS) project surveyed respondents on COVID crisis surge-related preparation and recovery activities, as well as strategy and lessons learned for the future.
- 1190 individuals representing 12 different roles from the health care engineering field participated in the CRTS survey. The largest role groups were Facilities Managers and Engineers who reported working within a single health care organization. Most participants across all roles were manager/supervisor level or higher (85.9%). There was nationwide participation.

WHO WERE SURVEY RESPONDENTS?

- 671 Facilities Management
- 173 Engineer
- 133 Construction
- 61 Architect
- 54 Manufacturing
- 33 Regulatory
- 29 Infection Prevention
  - The survey results reflects the activities of the 844 FMs and Engineers

THE COVID CRISIS EMERGES – EARLY ACTION

- The COVID crisis required great resilience, proactivity, and timely decision making. Facility managers and engineers immediately took action to prepare their hospitals, and consulted expert resources when researching surge related solutions. The CDC (26%) and ASHE (26%) were the most often consulted resources ASHRAE (17%), CMS (15%), AHJ (14%), Chapters (7%), AIA (5%)
- 73% of respondents stated that the facility management (FM) department was included in most or every part of the decision-making processes related to preparing their hospitals for potential surges and other COVID-related threats. 21% were only minimally included and 6% not at all.

ORGANIZATIONAL FURLOUGHS & PAY REDUCTIONS

- 8% laid off at least one staff member.
  - • 30% still have staff members laid off.
- • 26% furloughed at least one staff member.
  - • 68% still have staff members furloughed.
  - • 21% reassigned at least one staff member.
    - • 77% still have staff members working in reassigned areas.
- • 14% implemented salary reductions for at least one staff member.
- • On average, 31% reduction in pay. • Salary reductions most often occurred for those in higher positions. • 29% still have staff working under reduced pay.
- 4% loaned out at least one staff member with reduction in pay.
  - Residents serving as transporters, MA's as door screeners

THE SURGE AND WHAT WE DID

COMMONLY PERFORMED SURGE PREPARATIONS

- Separated entry points for COVID suspected patients
- Removed waiting room furniture to promote distancing
- Added protective barriers at interaction spaces
- Increased telehealth service and capacity
- Increased remote working for certain staff
- Increased morgue capacity
- Maximized Clinical space
- Curtailed construction and renovation projects
- Masks and PPE

87% OF RESPONDENTS NEEDED ADDITIONAL PATIENT CARE SPACE

- Medical Office space
- Parking Lots
- Shell space
- Auditoriums
- On call rooms
- Recovery rooms
- Procedure spaces
- Ships and Convention centers

CREATIVE CLINICAL SPACE

PROTECTING STAFF AND PATIENTS

- Facility Managers created anterooms (15%), reconfigured patient rooms (37%), entire wings (23%) and floors (22%).
  - Top methods: HEPA to outside
  - Negative air machine
  - Recirculated air cleaners
  - AHU conversions
- Converted office space to clinical space
- Created ICU type care units in other areas
- 37% added patient rooms totaling 22,467 patient beds

ALTERNATE CARE SITES

- 77% of survey respondents considered building or acquiring
  - 33% obtained tents for testing
- 15% designed at least one alternate care site
  - Gymnasiums, abandoned hospitals, convention centers, arenas, garages, schools and hotels
- 110 respondents started construction 104 completed construction
- Construction Costs (on average)
  - Partially completed projects-$50,000
  - Fully completed but altered $2.8 MM
  - Fully completed according to plan-$1.5MM
  - Majority of respondents took 5 weeks or less to complete

ALTERNATE CARE SITES: ENGINEERING SPECIFICATIONS

- 69% OF NEWLY BUILT SPACES WERE PARTITIONED RATHER THAN ISOLATED
- PRESSURE REQUIREMENTS OF NEWLY BUILT SPACES WERE:
  - 26% POSITIVE SPACE
  - 41% NEGATIVE SPACE, OPEN PODS
  - 24% NEGATIVE SPACE INDIVIDUAL PATIENT SPACE
  - 16% POSITIVE BUILDING, BUT NEGATIVE SPACE
- 50% PROVIDED O2 BUT LESS THAN 25% PROVIDED MEDICAL AIR

UTILIZATION OF ALTERNATE CARE SITES

- COVID TESTING 33%
- TREATMENT FOR COVID POSITIVE, PUI COVID 22%
- QUARANTINE FOR SUSPECT PATIENTS 18%
- TEMPORARY STAFF HOUSING 8%
- NON COVID TREATMENT SPACE 6%
- QUARANTINE FOR COVID POSITIVE PATIENTS 2%

Most ACS were in operation for more than 12 weeks

CHANGE IN OPERATIONS

- SHUT DOWN CONSTRUCTION PROJECTS
- LIMITED ENTRY TO HOSPITAL
- SOCIAL DISTANCE/MASK/PPE
- RESTRICTED VISITATION
- RECONFIGURED AIR HANDLERS
- ABHR EVERYWHERE

CHANGE IN OPERATIONS

- 1135 Waiver CMS
  - Certain ITM activities EXCEPT Fire Pump, Fire Extinguisher, Elevator fire fighter operations, Emergency generator/transfer switch and egress inspection in construction projects
  - ABHR placement but protect from inappropriate use
  - Fire Drills, will accept documented training activity
  - Temporary Construction, allowing for walls between patients

SCREENING ACTIVITIES

COVID-19 task force contribution (Jeff O'Neill)

- ESTABLISHMENT OF DEDICATED ENTRY
- ESTABLISHMENT OF ONE WAY FLOW
- HOURS OF OPERATION TO DETERMIN FLOW
- SCREENING STATIONS/TENTS Automated temperature check
- SCREENING QUESTIONS AS RECOMMENDED BY CDC
  - Fever, chills, cough, fatigue loss of taste or smell, travel

PATIENT CARE

- COHORT
  - Dedicated Covid units, groups all positive patients together
    - Reduced risk to non covid patients
    - Staff focused on PPE and unique care methods
    - Creation of negative pressure environment
    - Creation of Intensive Care treatment
    - Limits the movement through out the facility
    - Same room for duration of stay

PATIENT CARE

- Non cohort
  - Enables the use of existing facilities such as isolation rooms and other special environment in the hospital, such as ICU, Vent units
  - Staff training becomes difficult when changes in treatment methods or best practices
- To cohort or not should be determined by IC and other clinical professionals depending on the level of covid census

NEGATIVE AIR PRESSURE

- Rid the facility of the virus
  - Increase exhaust and spill on air handling units
  - Increase outside air
  - Obtained portable HEPA filtered air cleaners with or without Uvc for procedures involving aerosolization

- UVc Light
- H2O2 fogging
- Bipolar Ionization

HOW TO KILL A VIRUS

RECOVERY PLANNING

- Reinstatement of Elective Procedures-Majority Occurred Early June
- When to return to Normal Operations
  - Go/No go Plan-49% had no official go plan
- New Normal Continuation of new process
- Alternate care site future
  - 200 unsure, 121 decommissioned, 41 stored for future, 15 converted to warehouse, 9 made permanent 3 demolished
- Reflecting on the surge
  - Respondents believed they prepared significantly more than they were impacted and impact was greater in non-rural hospitals

RECOVERY PLANNING

What processes were started that you think should be continued? “New Normal”

- Reconfigure ahu 100%OA/100% exhaust
- Quarterly rather than monthly inspections
- Restrict Visitors
- Daily pressure monitoring of AIIR
- Limit vendor entry/close entrances
- Less frequent inspections
- Less nonessential maintenance
- PPE and ABHR everywhere

COVID RESPONSE TACTICS SHARING LESSONS LEARNED

- Working through frustration, uncertainty and reduced resources
  - Crisis duration? Patient load? Staff reductions? PPE & Equipment shortages? O2 shortages?
- Communication and input in decision making
  - Facility manager input was critical
  - Need regularly occurring communication between FM, IC and MD/RN
- Game time decisions were deemed to be of little value
  - Anterooms, surge tents (depending on climate), staff housing
  - Staff buy-in and acceptance is imperative
- Lack of clear and consistent guidance from CDC caused confusion

COVID RESPONSE TACTICS SHARING LESSONS LEARNED

- Pain points in daily operations
  - Maintaining air quality in negative pressure environment
    - Energy efficiency loss
  - Maintaining/enforcing social distance in elevators
    - Employees dining together, social activities
    - Changes in operations caused patient anxiety
- Key to success
  - Plan, plan and plan
  - Interdepartmental Coordination
  - Early FM input
  - EOP and flexible surge capacity
  - Drill, drill and drill
- Consideration of design changes with architects, engineers and staff

CONTINUING EDUCATION

- Tabletop Exercises on a regular basis
- Incident Command System drills and training
- How long and how much negative pressure
- How much filtration
- How much energy loss
- Consider permanent design and engineering changes

- COVID-19 Resources for Health Care Facilities | ASHE
  - www.ashe.org/COVID19resources

- Filtration Study-Bill Payne
- Alternate Care Site-Richie Stever

THANK YOU