

Cyberattack Exercise: A Drill Like No Other

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Polling Question

What type of organization do you represent?

- a. Hospital
- b. Ambulatory Clinic
- c. Health Plan
- d. Government
- e. First Responder
- f. Other



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Agenda

Greetings and Introduction

Cyberattacks and Healthcare

How We Built It...So They Would Come

Why a Functional Exercise?

What We Learned

Recommendations: To Infinity and Beyond

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Recognized for Quality

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Mayers Memorial Hospital



*Not shown: 41 Health Grade awards and 27 US News & World Report award badges

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2023 **DISASTER PLANNING CONFERENCE**

SACRAMENTO

Polling Question

How would you describe the state of your organization's cyberattack readiness?

- a. We are ready
- b. We are working on it, not quite there
- c. We are too busy – not a priority

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Cyberattacks and Healthcare

Healthcare entities continue to be a target of cyberattacks across the globe

Given the increasingly sophisticated and widespread nature of cyber-attacks, the healthcare industry must make cybersecurity a priority and make the investments needed to protect its patients (Healthcare and Public Health Sector | CISA)



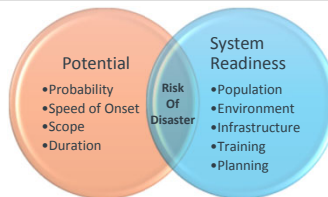
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Cyberattacks and Healthcare: Hazard Vulnerability Analysis

2023 (BASELINE)

TOP 10 HVA	RANK	OCCURRENCE
IT Outage: Infrastructure (Network failure, Internet or Intranet, Telecommunications)	1	4
IT Outage: Applications	2	6
Utility: General Utility Failure (Power, Water, Elevator, Internal Flood, Other)	3	20
Weather: Earthquake	4	5
Epidemic/ Pandemic	5	4
Workplace Violence Threat	6	0
Supply Chain Shortage / Failure	7	4
Security Event: Armed Intruder	8	0
Security Event: Civil Unrest	9	1
Patient Surge/Mass Casualty Incident/Seasonal Influenza	10	2

Infrastructure = Complete



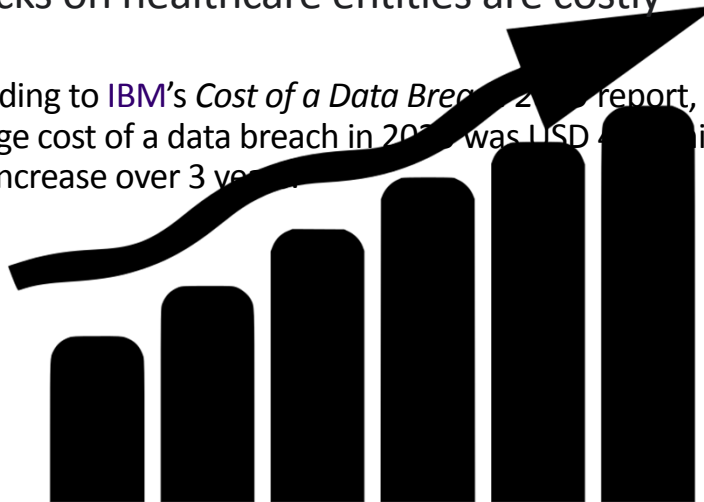
Applications = Partial

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Cyberattacks and Healthcare

Attacks on healthcare entities are costly –

According to IBM's *Cost of a Data Breach 2019* report, the global average cost of a data breach in 2019 was USD 4.24 million, a 15% increase over 3 years.



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Cyberattacks and Healthcare



CISA's Shields Up: Guidance for Organizations – *developing a heightened posture*

- Reduce the likelihood of a damaging cyber intrusion
- Take steps to quickly detect a potential intrusion
- **Maximize the organization's resilience to a destructive cyber incident**
- **Ensure that the organization is prepared to respond if an intrusion occurs**

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Who in the last twelve months has performed a **Cyberattack** drill or exercise?

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Cyberattacks and Healthcare: Why do we have a problem?



Vulnerability

More reliant on digital technology



Vulnerability

Integrated systems



Vulnerability

Multiple types of networked system devices



Vulnerability

Vendor interfaces



Vulnerability

The bad guys keep getting smarter

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Cyberattacks and Healthcare: Stuff Happens



Type	Messages	Percent
Blocked: PDR	3,002,824	33.27%
Accepted	2,894,247	32.07%
Blocked: Email Firewall	1,265,553	14.02%
Blocked: Invalid Recipients	1,046,849	11.6%
Blocked: Others	623,720	6.91%
Blocked: Spam	190,394	2.1%
Blocked: Anti-Virus	48	<1%
Blocked: Zero-Hour	23	<1%
Total	9,023,658	100%

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How We Built It...So They Would Come

The not-so-positive perception of EXERCISES

Too many other competing priorities.

Drills don't represent real life.

Fear of exposing gaps and weaknesses.

Why do you need me there?

Didn't we just do this?

I already know what to do.

We'll (hopefully) never need to use the plans.

Can lack the energy of an audience

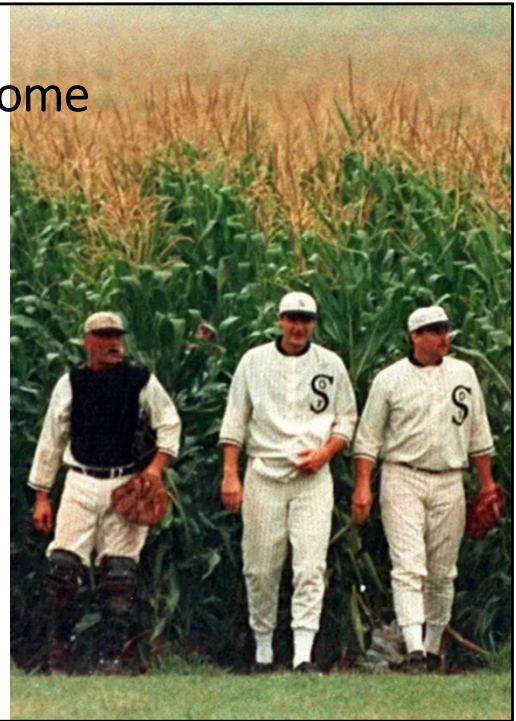
Someone else (IT) will take care of it.

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How We Built It...So They Would Come

Tips for developing and executing a high-value drill:

- Executive buy-in
- Short list of goals
- Time to prepare (Operations) for the event
- Realistic scenario – actual events
- Use of collaborative tools

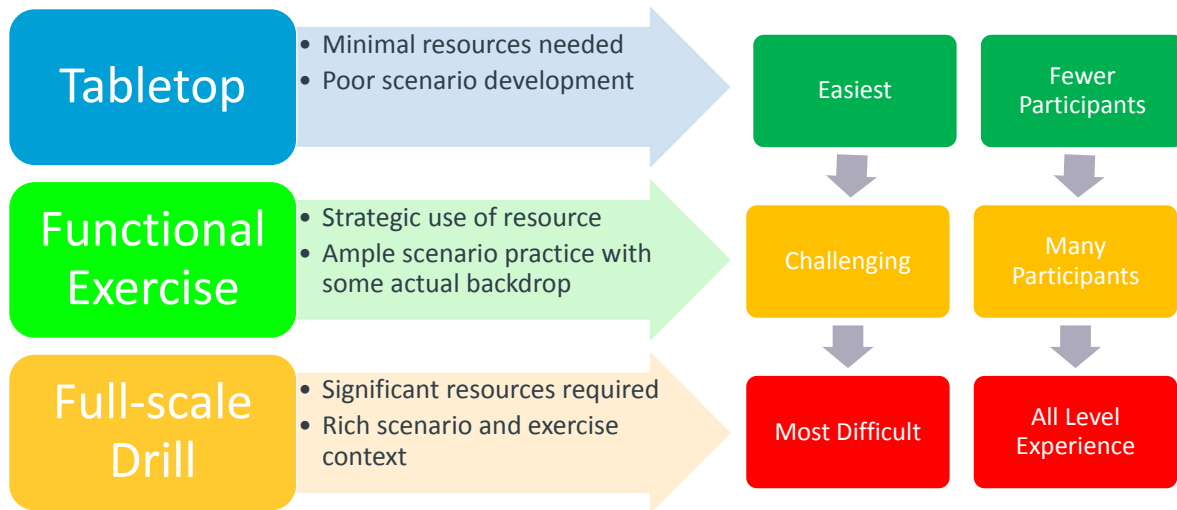


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A graphic with a blue background filled with white code snippets. In the center is a portrait of a man with glasses and a goatee, wearing a suit. To his right is a white speech bubble containing the text "May I have your attention please...". Below the portrait and speech bubble are several icons: a speaker icon, a lightning bolt, a house icon, and a factory icon. The code snippets include various JavaScript and JSON-like structures, such as "settings", "product", "PageLoadTime", and "Products".

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Why a Functional Exercise?



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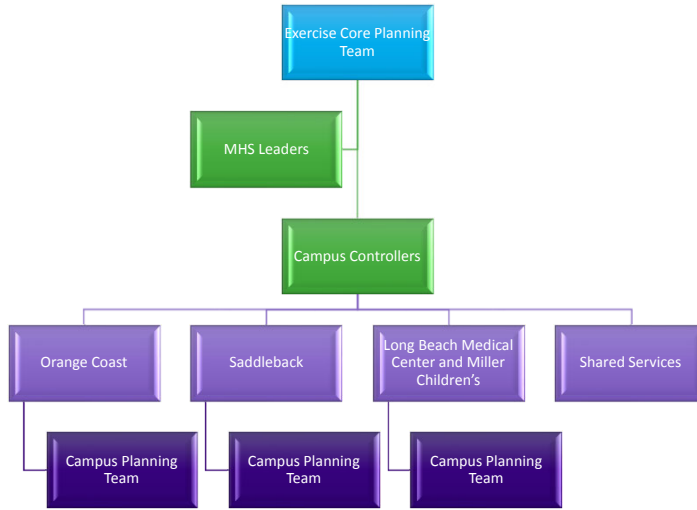
Functional Exercise Round One

- Who: MemorialCare event involving key Operations leaders; post offices
- What: Conduct an exercise to simulate a response to an Epic EMR and interface outage
- When: Tuesday, 4/28/2021 from 10:00 am to 12:00 pm
- Where: All entities will be forming Command Centers to respond to the attack; Zoom will be available to connect the Command Centers



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Functional Exercise: Planning



Exercise Core Planning Team:
Danny and Steve

- Overall

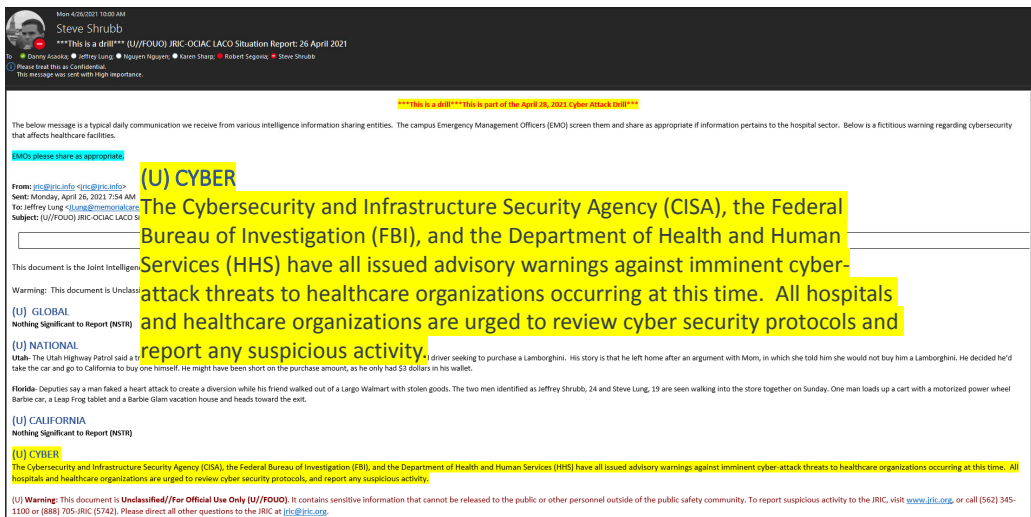
MHS Leaders: Executives from each campus

- Oversight/Approval

Campus Controllers

- EMO and IT Support Coordinators from each campus
- Identified campus-specific needs and planning

Functional Exercise: Alerts



Functional Exercise: Alerts

Wednesday, April 28, 2021

[DRILL]LBM/MCH Quarterly Test [DRILL]This is a test of the AlertMC mass notifi...
<https://evb.gg/n#eppppp5tig/06VJNofw> or Reply with YES to confirm receipt.

9:46 AM

MemorialCare
MC Alert System
(TEST) EMERGENCY ALERT!

LBM/MCH Quarterly Test
 This is a test of the AlertMC mass notification system. In a real emergency, this message will contain important alert information. Use this opportunity to update your employee information in M.E. to receive these messages in the priority you would prefer.

DISMISS

Service Desk

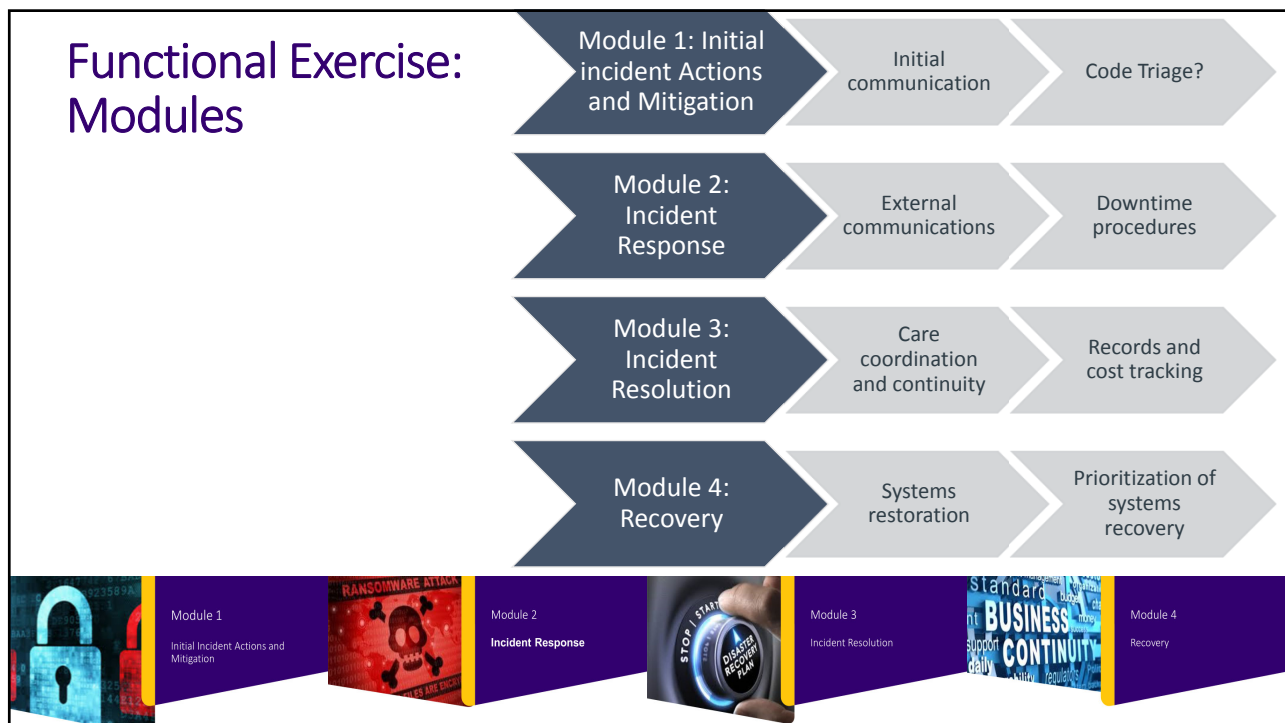
Important Information Services Advisory

THIS IS A DRILL

We have been receiving reports of Epic sluggishness throughout MemorialCare at this time. Information Services is working with multiple vendors to assess the issue and restore full functionality.

Please stand by for further updates.

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Polling Question

Which category requires the most "exercise" in your organization?

- Initial communication/code response
- Downtime procedures for affected systems
- Tracking written documentation and costs
- Prioritization of systems to recover



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Module 1: Initial Incident Actions and Mitigation



Each Command Center had breakout sessions to discuss the below questions. All Command Centers came back together to briefly discuss their response (via Zoom)

Question 1:

A general statement has been sent to post offices that MemorialCare may be under a cyber-attack. Who or what groups would be informed of the details of the situation and how would they be informed at this time?

Question 2:

Who makes decisions in terms of the downtime procedures utilized at this time and the next steps?

Question 3:

Do we feel compelled to activate our response plans, business continuity plans, or a Code Triage Internal? If so, would it be just Information Services, or would it include representatives from other departments and leadership? Would HICS be utilized?



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Module 2: Incident Response

“At approximately 1:00 pm, Information Services has informed the Incident Command at all entities that the ransomware is a confirmed attack by use of Cryptolocker..”

Question 1:

What internal and external messages would need to be developed? How are the messages being distributed? Who leads the public information process?

Question 2:

What are the business implications of the scenario? How would we determine them, e.g. brand, reputation, or financial impact?

Question 3:

How will clinical documentation through the ED and new admits be managed with an extended downtime and no recovery in sight? Where will these records reside? How will these records be managed and organized?



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Module 3: Incident Resolution

“At approximately 8:00 pm, MemorialCare leadership and Information Services decided that the ransom would not be paid. MemorialCare has made the decision to restore Epic from backup, which will require approximately 72 hours to perform.”

Question 1:

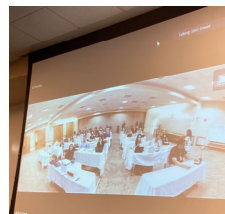
How could we coordinate patient treatment with other health and medical providers, e.g., sister facilities, hospitals, surgical centers, long-term care facilities, clinics?

Question 2:

How are costs tracked? What records or paperwork is needed to do so?

Question 3:

How can departments that use Epic or depend on data from Epic be coordinated? Who should they be coordinated with?



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Module 4: Recovery



“At approximately 1:00 pm Saturday afternoon, Information Services announces that Epic has been restored with data that goes back to Tuesday, 4/27/21 at 11:59 pm. Interfaces to and from systems appear to be restored at this time. MemorialCare has been waiting anxiously for this announcement, and it has come ahead of the scheduled estimate of 8:00 pm.”

Each Command Center documented their responses

Question 1:

How will the recovery communication be managed?

Question 2:

What will MemorialCare say to the Media at this time?

Question 3:

How would leadership establish a well-coordinated, organized approach to recovery considering multiple services, hospitals, clinics, and affiliates?

Organizational Capability Target	Associated Critical Tasks	Observation Notes and Explanation of Rating	Target Rating
Execute operations with functional and integrated communications among appropriate entities	<ul style="list-style-type: none"> Effective and efficient communications were established and maintained with key stakeholders Situational assessment was shared with IC and Command staff Communication shared between MC campuses 	<p>Zoom check in 1:00pm, 3:00pm, 5:00pm</p> <p>same audio clips</p> <p>grot dialogue</p>	P
Mobilize all critical resources and establish command, control, and coordination structures	<ul style="list-style-type: none"> Activate Hospital Command Center HCC role assumed promptly Staff reported to assignments in a timely manner Develop an Incident Action Plan within 45 minutes of activation Hospital Physician in Charge role was assigned and responded to the HCC Member of IT assigned to HCC 		P
Enhance and maintain National Incident Management System (NIMS)-compliant command, control, and coordination structures	<ul style="list-style-type: none"> Establish branches, groups, and divisions needed to manage the incident and meet incident objectives and strategies Use of IHCS forms to guide and document Incident Action Plan Identify need for downtime procedures Complete IHCS 215 		P
Establish sufficient communications infrastructure within the affected areas to support ongoing life-sustaining activities, provide for human needs, and prepare for recovery	<ul style="list-style-type: none"> Utilize telephone, RedNet, email, and/or IHAM radio to submit information Utilize AlertMC for situational communication 	Edim	P

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After Action Report



Healthcare Facility Business Continuity Plan Exercise: Cyber Attack

After-Action Report/Improvement Plan 4/28/2021

The After-Action Report/Improvement Plan (AAR) is a key exercise objective with the purpose to include the Senior Preparedness and Incident Response and Recovery Teams. Review observations regarding the procedures, planning and performance in the AAR and determine appropriate actions to be taken to improve the organization's preparedness.

ANALYSIS OF CAPABILITIES

Aligning exercise objectives and capabilities provides a consistent taxonomy for evaluation that transcends individual exercises to support preparedness reporting and trend analysis. Table 1 includes the exercise objectives, aligned capabilities, and performance ratings for each capability as observed during the exercise and determined by the evaluation team.

Table 1 Summary of Capability Performance

Capability	Objective	Rating
Execute operations with functional and integrated communications among appropriate entities	<ul style="list-style-type: none"> Effective and efficient communications were established and maintained with key stakeholders Situational assessment was shared with IC and Command staff Communication shared between MC Campuses 	P
Mobilize all critical resources and establish command, control, and coordination structures	<ul style="list-style-type: none"> Activate Hospital Command Center HCC role assumed promptly Staff reported to assignments in a timely manner Develop an Incident Action Plan within 45 minutes of activation Hospital Physician in Charge role was assigned and responded to the HCC Member of IT assigned to HCC 	P
Enhance and maintain National Incident Management System (NIMS)-compliant command, control, and coordination structures	<ul style="list-style-type: none"> Establish branches, groups, and divisions needed to manage the incident and meet incident objectives and strategies Use of IHCS forms to guide and document Incident Action Plan Identify need for downtime procedures Complete IHCS 215 	P
Establish sufficient communications infrastructure within the affected areas to support ongoing life-sustaining	<ul style="list-style-type: none"> Utilize telephone, RedNet, email, and/or IHAM radio to submit information Utilize AlertMC for situational communication 	P

Healthcare Facility Business Continuity Plan Tabletop Exercise: Cyber Attack
MemorialCare Health Services
Incident Security Exercise and Evaluation Program (ISEE)

Identified Strengths	Opportunities for Improvement
Command Center role players assumed roles and had necessary materials to perform duties.	Zoom is a great tool to connect all Command Centers and key-role players. The Command Centers need to be equipped to facilitate this resource.
Use of sharing real-life communication resources such as Joint Intelligence Regional Center (JRIC) communications enhanced information gathering and situational awareness.	There is a gap in what we think we have versus what we actually have. Clinical waiting for IT to determine cause of downtime or event.
There was good use of communication methods (Email, AlertMC {Everbridge}, Alertus Messaging Banners, PerfectServe)	“Communication came via all avenues.....hospital phone, text and email....once responded, I would like to see the other notifications to stop.”
Discussion regarding scope of business impact was enlightening	Only 47% of department leaders stated they have a Business Continuity Plan.
Having IT leadership update and drive conversation regarding what is working and what is not was helpful.	96 hours of forms on hand – An understanding of current needs for each department. Master list needed and use of outside resources maybe needed to obtain forms.

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Cyber Attack Exercise 2.0 6/20/2023

“Well, that was fun!
Why don’t we do it
again?”



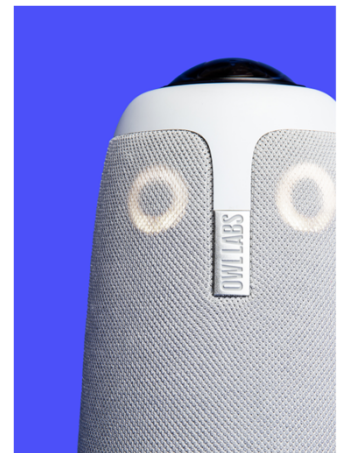
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Exercise Comparison (2021 to 2023)

- Exercised calling a Code Triage Internal Disaster and Command Center Formation
- Use of Zoom Break-out Rooms and Owl Labs Video Conference Tool
- Decreased from 4 to 3 modules (timing and tolerance)
- Capabilities and Objectives followed 2021

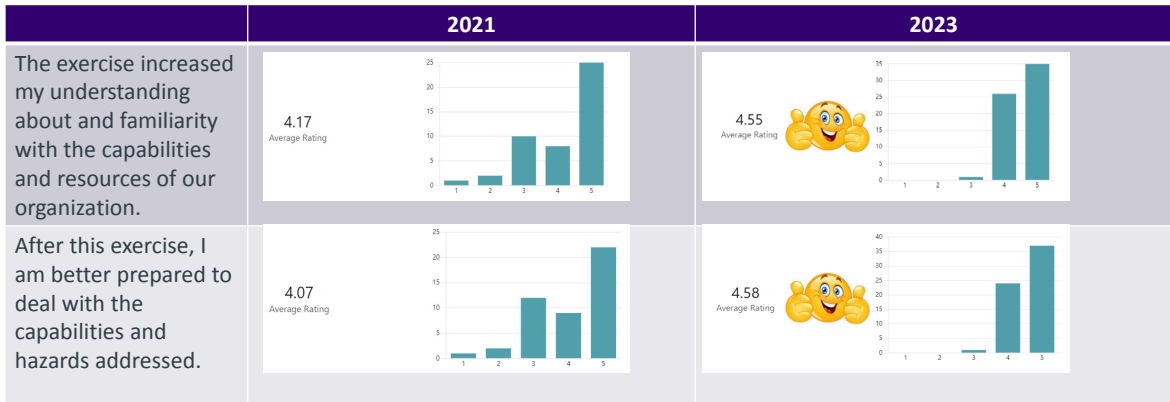
Scenario:

“A privileged MemorialCare user inadvertently provided username and password credentials to a cyberattack actor located in the Russian Federation. After detecting and confirming the attack, MemorialCare decided to shut down the Internet in order to avoid further issues and contain the attack.”



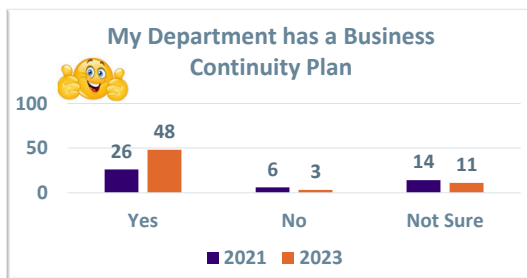
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Exercise Comparison (2021 to 2023)



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Exercise Comparison (2021 to 2023)



After our 2021 exercise, we updated our Business Continuity Plans. We also added a "Loss of Technology" response and continuity plan to our BCPs.

MemorialCare
Locations: Long Beach, Orange Coast, Saddleback

Event Type: Loss of Technology

Loss Type Definition: The main facility where the business area resides has suffered a partial and/or full technology interruption that impacts essential activities for an indefinite period of time.

The Emergency Department has a critical degree of dependence on technology to meet the MemorialCare mission and providing optimal patient care. Manual workarounds for essential technology and activities is limited or cannot be used for an extended period of time without impacting patient care and/or the accuracy of data.

Department Management – Task List

#	Phase II: Recovery Tasks & Guidelines	Completed		
		Yes	No	N/A
1.	Assemble the essential staff and complete a preliminary assessment. Consider patient care and operational impacts.			
2.	Determine if and when it's feasible to implement manual downtime procedures processes for affected technology. Consider: <ul style="list-style-type: none"> Leverage manual tracking forms and/or create using MS Office (e.g., Word, Excel, etc.). Ensure tracking of information is sufficient to support an audit trail (e.g., patient name, date, test type, and other relevant information). 			
3.	Assess staff availability and determine if additional resources are required to support (manual) workarounds.			
4.	Brief staff on modifications to roles and responsibilities, essential services, and other expectations during the BCP activation.			
5.	Adjust manual workarounds and strategies throughout the disruption and ensure minimal disruptions where possible.			
6.	Refer to department policies/procedures and implement the applicable strategies required to recover from a Loss of Technology scenario.			
7.	Facilitate frequent sessions with department staff to obtain and provide status updates. <ul style="list-style-type: none"> Instruct staff to maintain a daily log of recovery activities, impacts and modifications to service delivery, and other notable incidents. Refer to Appendix B for specific requirements. 			
8.	Provide oversight to ensure department policies and procedures are adhered to during the disruption. <ul style="list-style-type: none"> Escalate and obtain approval from leadership for exceptions to business-as-usual activities. 			

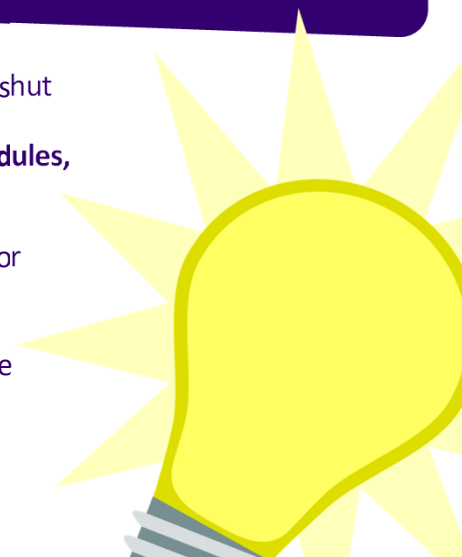
Information Services. The IS Service Desk or other applicable IS resources will coordinate technology and telecom recovery efforts internally or with the applicable third-party provider to ensure the timely resolution and restoration of services. IS leadership will provide status updates to the HCC throughout the event (e.g., estimated time of resolution) and other relevant information.

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Key Learnings

Command Center and Core Team Feedback

- Need to further refine, document, and share the process to shut down the Internet
- **Electronic and hard copies of key information (on-call schedules, phone listing, etc.) need to have established, publicized locations**
- Need clear P&P for PerfectServe, Everbridge use during major incidents
- **Remote user policy for incident response**
- Succession planning with rotation of various leaders in future exercises
- Clear thresholds and steps to determine diversion and cancellation of electives

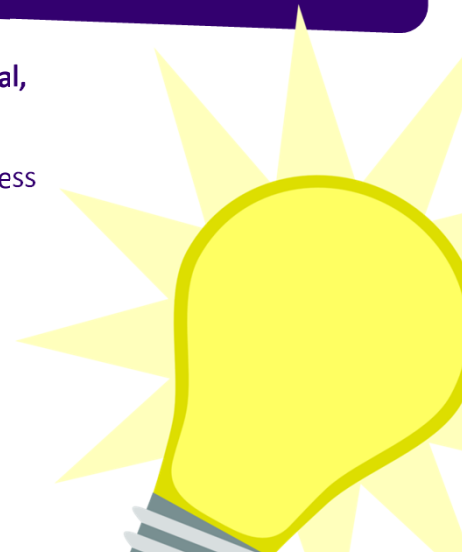


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Key Learnings

Command Center and Core Team Feedback

- **Evaluate the frequency of exercises and drills – semi-annual, quarterly, unannounced, by department or service**
- Further assessment of the payroll process; sharing of downtime procedures so that leaders can support any process required
- **Establishment of entity downtime committees to be the responsible party for new and ongoing P&P, assist with maintenance**
- Communication across MemorialCare entities AND non-MemorialCare entities must be consistent and controlled; further training is needed for all levels of staff. Non-MC Affiliates would require custom comm and instruction packages



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Key Learnings

Command Center and Core Team Feedback

- Downtime tool inventory and regular checks required – PCs, forms, reports, printers
- **Conduct a deep dive into the Navigation Center requirements during an outage**
- **Understand key systems dependencies (email, Epic, PeopleSoft, ParEx, MyChart, RightFax, etc.) on Internet and establish technical workarounds in advance for high priority applications**
- E-prescribe process to be reviewed for an established downtime procedure
- Need to design a P&P for returning workers back to sites – prioritization, location, space, equipment
- Established PIO presence and process



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Recommendations: To Infinity and Beyond



MemorialCare

Establishment of entity downtime planning committees with clear roles and responsibilities; executive sponsorship

P&P for managing remote work force during major incident

Regular downtime exercises including system-wide, entity-wide and specific services; unannounced exercises

Standard procedure for diversion and cancellation of electives

Formal, required, annual training to include a cyberattack and downtime module

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Questions



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Thank you

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