Managing EHR Downtimes: Implementing Tools from Response

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Boston Children's Hospital
Until every child is well™

HARVARD MEDICAL SCHOOL
TEACHING HOSPITAL

Agenda

Review of Downtime Prevalence BCH

Implementing Lessons Learned

- HICS
- Resources and Assets
- Staffing
- Communication

Culture Shift

Current Status

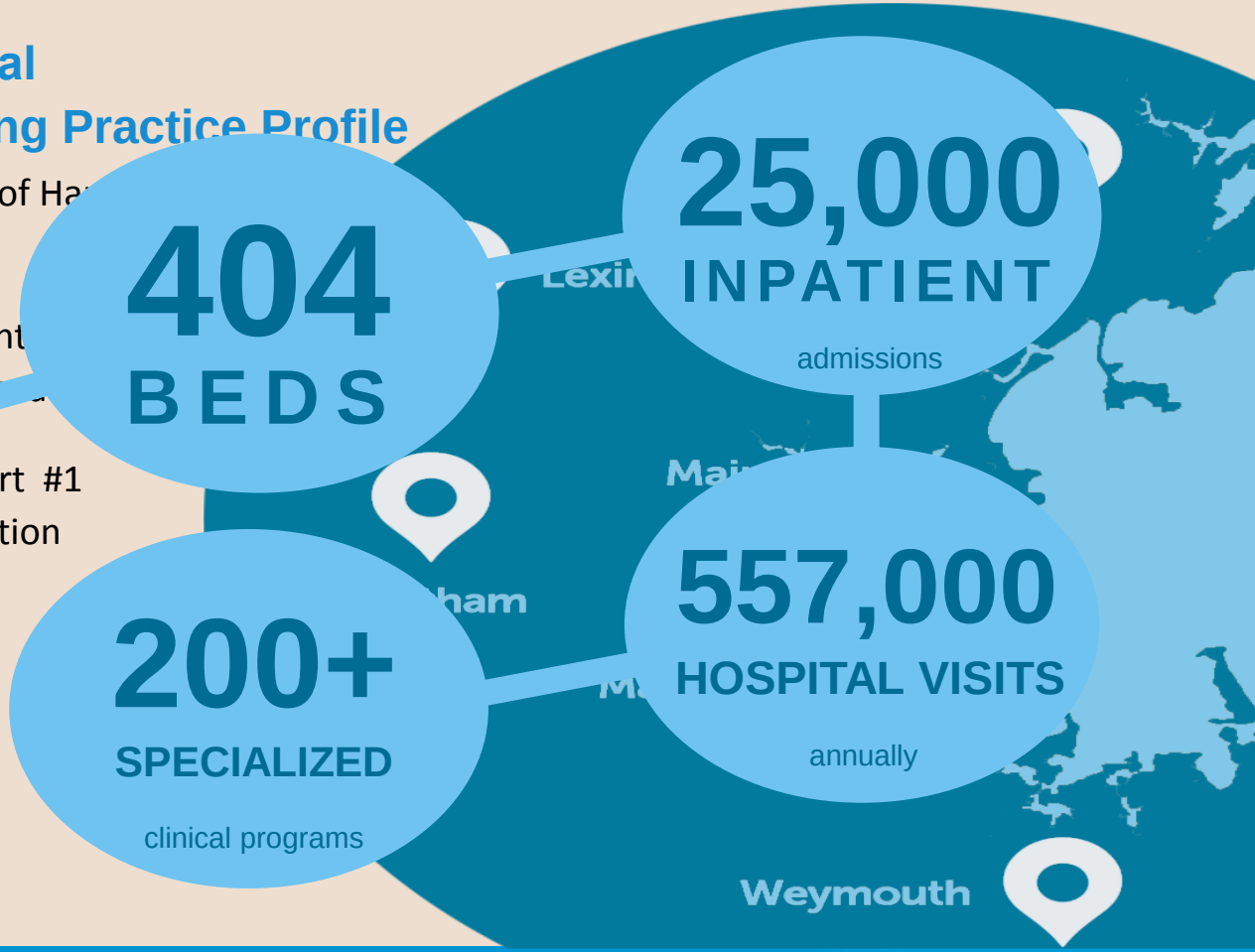
Boston Children's Hospital
Organizational and Nursing Practice Profile

Primary pediatric teaching hospital of Ha
Medical School

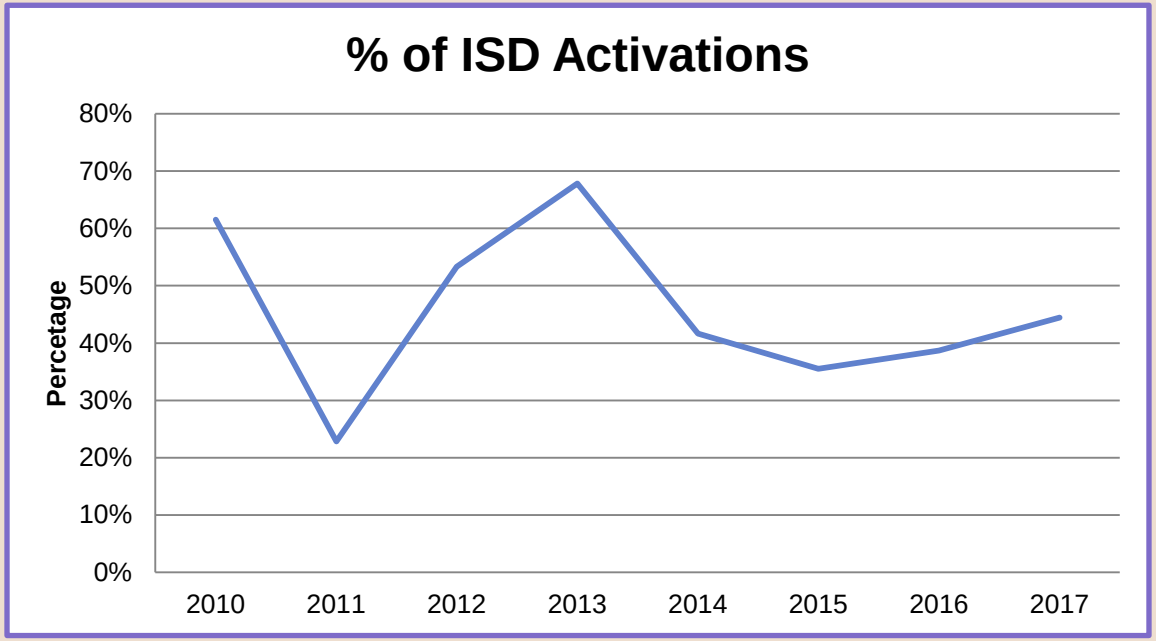
World's largest pediatric research ent
leader in translational scientific in

2017-18 U.S. News and World Report #1 ranked Children's Hospital in the nation

- 8 satellite and physician offices
- 7 community hospitals
- 12 community health centers



BCH ISD Disruptions



Percentage of ISD disruptions from all HICS activations 2010-2017

Cyberattack 2014

BRUINS WIN IN OVERTIME, 3-2, PUSH RED WINGS TO THE BRINK — C1

The Boston Globe

FRIDAY, APRIL 25, 2014

In the news

Late shift

Friday: Turning rainy at night; high 58-63, low 41-46

Saturday: Rainy, cooler; high 47-52, low 39-44

High tide: 8:30 a.m., 9:04 p.m.

Sunrise: 5:48 Sunset: 7:37

Complete report, **B13**

Cyberattack hits Children's Hospital

May be the work of group opposing teen's treatment

By Michael B. Farrell and Patricia Wen
GLOBE STAFF

The infamous computer hacker network known as Anonymous threatened to attack Boston Children's Hospital over the child custody case involving Justina Pelletier last month, just a few weeks before the medical center's website was subjected to numerous cyber-assaults.

The anti-authority members of Anonymous sometimes appear in Guy Fawkes masks.

Anonymous has made its interest in the case clear. Several weeks ago, the group claimed responsibility for an attack on the website of Wayside Youth and Family Support Network, the Framingham residential facility where 15-year old Justina has been living since January under state custody.

After the more recent attack on Children's, some patients and medical personnel could not use their online accounts to check appointments, test results, and other case information after the hospital shut down those Web pages.

The threats from Anonymous are the latest to emerge against

Firefigl deal wo raise pa by 18.8

City's 6-year p put at $92.4m is expected ne

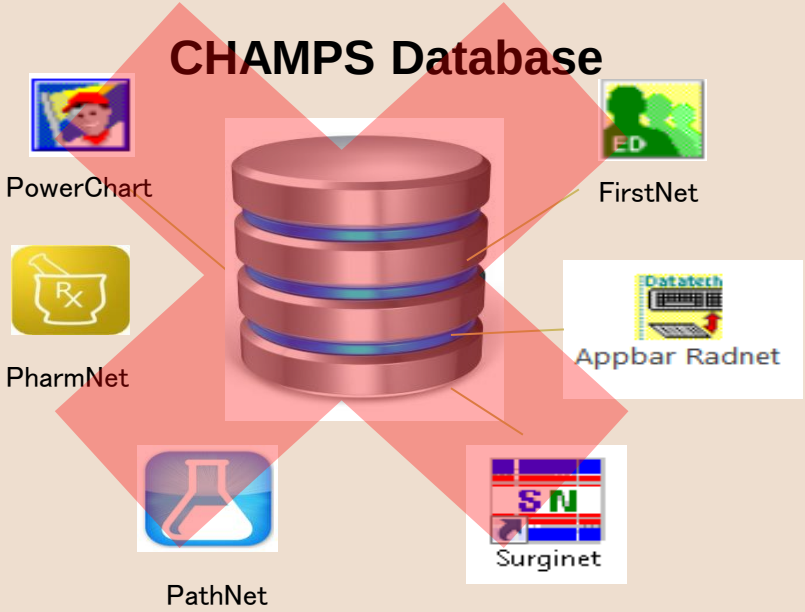
By Meghan E. I

5 Day Downtime 2015

March 20 at 1:05 p.m. until March 25 at 8:52 a.m.

All CHAMPS systems impacted

Systems returned for a 12-hour period beginning approximately March 20 at 9 p.m. until March 21 at 9:15 a.m.



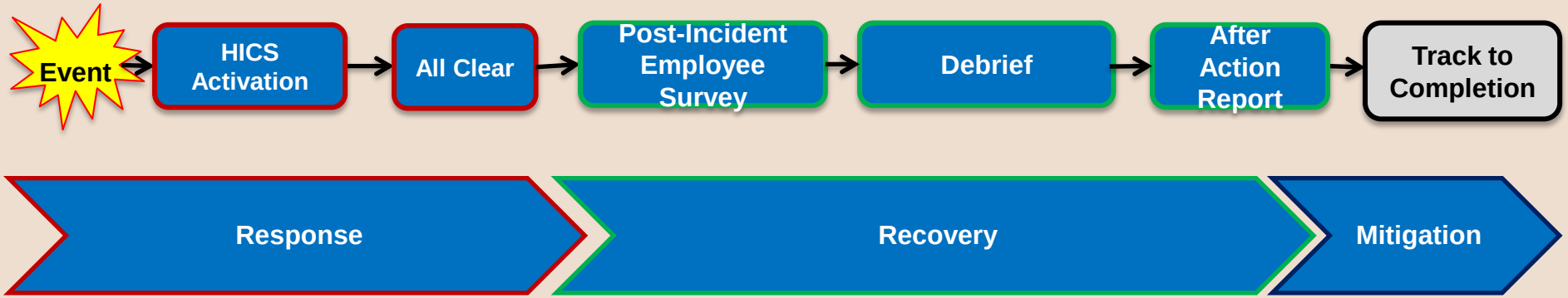
Impacts beyond the EHR

- Paging and communication systems
- Online drug formulary
- Custom applications
- Polices & Procedures
- Web-based clinical resources
- Research databases/registries
- Patient food ordering
- Lab instrument interfaces

Not all downtimes are created equal. EHR, Network, and single application downtimes have different impacts to the institution.

Capturing lessons learned: The Emergency Management Process

After Action Reports are created after a Hospital Incident Command System (HICS) activation. All Action Items are prioritized and assigned a responsible party and an Emergency Management staff member to track to completion.



We had some experiences…

So what did we learn?

Lessons learned

- Hospital Incident Command System
- Resources/Assets
- Staff
- Communication

Lessons Learned:
Hospital Incident Command System

Themes:

- Inadequate departmental downtime plans
- Training needed for HICS positions for downtime roles
- Further understanding of impacted systems and integration of systems for decision making purposes
- Need for Recovery Roles

Downtime Planning

Plans created for the following areas:

- Inpatient Units
- Lab
- Pharmacy
- Radiology
- Ambulatory Areas
- Nutrition
- Food Services
- Physical Therapy
- Satellite locations
- Social Work

Successful planning tips

- Ensure departmental buy-in
- Flexible planning options (checklist)
- Ensure a sustainability plan
  - Use during planed downtimes

Incident Command Training

- HICS Training and Role Clarification
  - Nursing Administrator on Call
  - Informatics Fellows
  - Network liaisons
  - Recovery positions and responsibilities

Establishing Command and Control

Clinical Education and Informatics created multiple tools to help inform response decision making.

Tools inform response decision making.

Systems Integration Information

The following systems may be impacted if the hospital disconnects Internet connection. Systems marked RED are currently down. (This is not a comprehensive list)
NOTE: For ALL other systems that are not listed below (i.e. CHAMPS), follow standard downtime procedures

Application	Application Descripti	Current Statu	Role	Responsible Department	Hosted internally or externally?	Severity	IF AFFECTED- Short Term Contingenc	IF AFFECTED- Long Term Contingency
PPOC eClinical Works		Unaffected					VPN access, based on IP)	PPOC practices in process of making long term contir
ePrescribe		Unaffected					Print prescriptions	Print prescriptions
Xtend Paging System		Unaffected					Call operator for direct page	Call operator for direct page
VPN/ Remote Login		Unaffected					For critical issues, on site access required. External coders, EDs schedules, labs and	siloh access will be provided
Life Image		Unaffected					Patient will need to bring in CDs of films/radiology reports. Automatic reports	Patient will need to bring in CDs of films/radiology r
Telemedicine systems		Unaffected					None-Verbal Communications	None-Verbal Communications
NEHEN - Patient Eligibility and		Unaffected					Billing and remittals suspended short term	Billing and remittals managed by previous paper pro
MyChildren's Patient Portal		Down					Email the mychildrens helpdesk for needed information, landing page activated, landing	Email the mychildrens helpdesk for needed informa
MyPatients Provider Portal		Down					message activated	Contact individual department
Lexi Comp		Unaffected					term availability	Books and reference sheets will be placed on all unit
MicroMedex		Unaffected					term availability	Books and reference sheets will be placed on all unit
Secure email		Unaffected						
3M		Unaffected					and fax	Create a word template with information and fax
Computer Assisted Coding		Unaffected					No Workaround	No Workaround
Scanning		Unaffected					Contact HIM for scanned documents.	Scan after the system returns
Esker Deliveryware/CHB Fax		Unaffected					will be seen when email is back up	Need to establish
Transcription System		Unaffected					Hand written notes	Hand written notes
Outlook		Unaffected					None	None
Intellibridge (Biomed)								
NeoFax		Unaffected					term availability	Books and reference sheets will be placed on all unit

Timeline and Impact List

SYSTEM NAMES		Description	SYSTEM CONTACT	0-15	16-30	31-59	1-2 hr	2-3 hrs	3-4 hrs	4-5 hrs	<5hrs
Cerner Classic (PFT & Blood Donor Ctr)		Processing & Tracking Blood Donations									
CHAMPS Cerner Millinium	Pathnet	Pathology Results		Support	Support	Support	Essential	Essential	Essential	Essential	Essential
	Power Chart	Main patient chart (all clinical activity)		Support	Support	Essential	Essential	Essential	Essential	Essential	Essential
	PharmNet	Drug administration/management									
	FirstNet	Patient processing/tracking		Essential	Essential	Essential	Essential	Essential	Essential	Essential	Essential
	SurgiNet	operation/schedule/process of surgical cases									
	RadNet	Radiology results		*coming soon*							
Synapse (PACS)											
Epic		Admission, discharge, transfer		Essential	Essential	Essential	Essential	Essential	Essential	Essential	Essential
Eclipsys		EMR for ICUs (*Entirely separate system)		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
EM Station		Old ED Operations Software		If estimated return to normal operations is known, then xxx. If unknown, then yyyy							
a		Bed management		*coming soon*							
Chemo Order Entry (COE)		order & administer chemotherapy		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Emergency Department / Inpatient / OR

System Status Grid

☑ AIMS	☑ Epic	☑ Patient Flow
☑ ALICE	☑ External Record Portals	⊘ PeopleSoft Finance/Materials Mgt
⊘ API/STAARS/PCS	☑ External Web	⊘ PeopleSoft HR/Payroll
☑ Capacity Insight Dashboard	☑ GetWell	○ Printing
☑ CHAMPS	☑ Interfaces	○ Radiology/Synapse
☑ CHMenu and all web apps	☑ Internal Web	☑ Remote logins (VPN and Web VPN)
☑ COE	☑ Network (Internet access)	☑ Report Viewer
⊘ Data Warehouse	☑ Network drives (P:,J:,S:)	○ SharePoint
○ Email	⊘ Nurse Call	⊘ Safety Event Reporting System (SERS)
☑ Enterprise Faxing	○ Paging	
☑ *Available, no impact*	○ *Intermittent or partial impact*	⊘ *Unavailable during maintenance*

The following applications will be unavailable or not receiving data updates during this time:

Application	Reduced Availability

Process to go to Paper

- AOD makes the final decision to go to paper (under guidance from CEI, ISD)
  - Goal is to make a decision within one hour of disruption
- Information is sent to users with the downtime pin
  - Communications sent to phones, email, pagers with downtime pin
  - RICOH Printers used for printing

Lessons Learned:

Resources and Assets

Themes:

- Downtime Forms
- Lab resource/asset needs
- Pharmacy needs

Documentation and Information Management

Issues

Staff inexperience with paper documentation

- Old documentation forms being used
- Delays in billing due to coding
- Documentation from downtime had many compliance issues (i.e. missing dates, times and/or signature, etc.)
- Potential for duplicate documentation

Solutions

Revised/standardized downtime paperwork

- Prepared an annual downtime education for all clinical staff
- Outdated form removal

Focused Education

- How to use a paper flow sheet and paper Medication Administration Record (MAR)
- Prescriber guidelines for an EHR downtime
- Ordering during downtime
  - Essential components of an order
  - Prescriptions during downtime
  - Order re-entry during downtime recovery
- Documentation during downtime and recovery

Creating a Downtime Binder

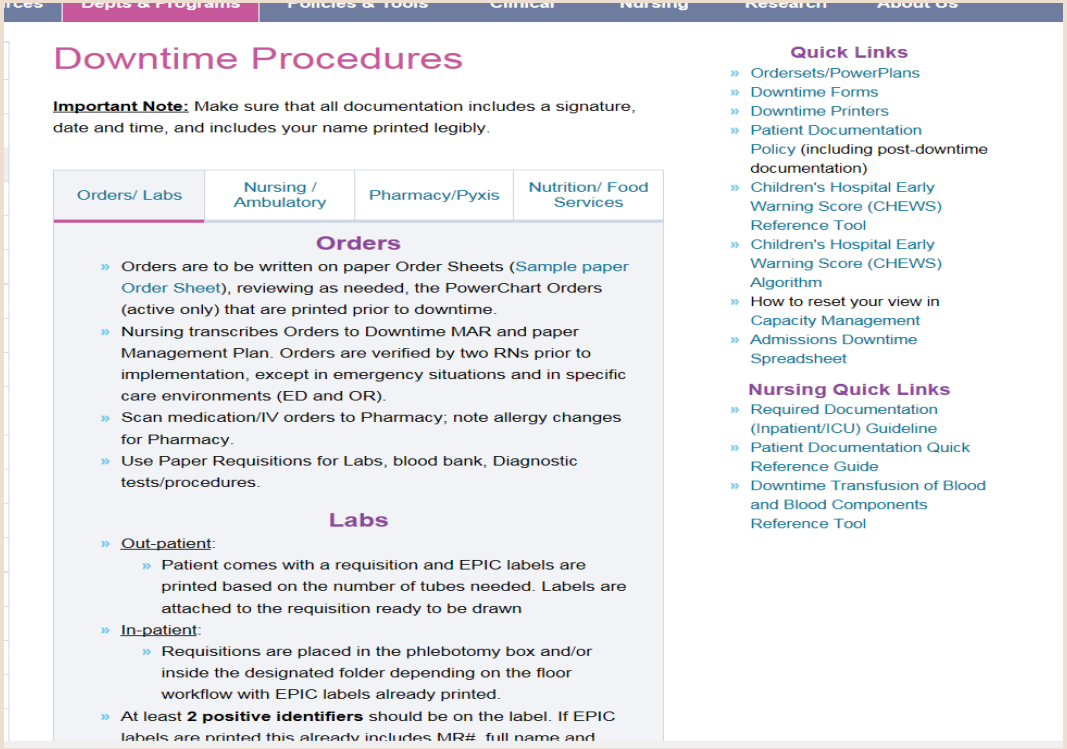
- Prescriber Order Forms
- Medication Administration Record (MAR)
- Nursing Admission Assessment (NAA)
- Progress Notes
- Inpatient and Critical Care Flow Sheet
- Management Plans
- Blood Bank Requisition and Lab Order Sheet
- Discharge Plan, Summary, and Additional Instructions

- Documentation policies
- Sample orders
- Sample Prescriptions (including DME)
- Reminder to use downtime order sets
- Directions for documentation of medications
- Guidelines for completing requisitions
- Area downtime preparedness checklist
- Medication History form

Version Control

Use of an internal website with instructions/documents.

- Acts as the single source of truth
- Command Center can update in real time
- Available to address immediate staff questions
- All communication refers to this website
- Contact information included



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Downtime Procedures

Important Note: Make sure that all documentation includes a signature, date and time, and includes your name printed legibly.

Orders/ Labs | Nursing / Ambulatory | Pharmacy/Pyxis | Nutrition/ Food Services

Orders

- Orders are to be written on paper Order Sheets (Sample paper Order Sheet), reviewing as needed, the PowerChart Orders (active only) that are printed prior to downtime.
- Nursing transcribes Orders to Downtime MAR and paper Management Plan. Orders are verified by two RNs prior to implementation, except in emergency situations and in specific care environments (ED and OR).
- Scan medication/IV orders to Pharmacy; note allergy changes for Pharmacy.
- Use Paper Requisitions for Labs, blood bank, Diagnostic tests/procedures.

Labs

- Out-patient:
  - Patient comes with a requisition and EPIC labels are printed based on the number of tubes needed. Labels are attached to the requisition ready to be drawn
- In-patient:
  - Requisitions are placed in the phlebotomy box and/or inside the designated folder depending on the floor workflow with EPIC labels already printed.
- At least **2 positive identifiers** should be on the label. If EPIC labels are printed this already includes MR# full name and

Quick Links

- Ordersets/PowerPlans
- Downtime Forms
- Downtime Printers
- Patient Documentation Policy (including post-downtime documentation)
- Children's Hospital Early Warning Score (CHEWS) Reference Tool
- Children's Hospital Early Warning Score (CHEWS) Algorithm
- How to reset your view in Capacity Management
- Admissions Downtime Spreadsheet

Nursing Quick Links

- Required Documentation (Inpatient/ICU) Guideline
- Patient Documentation Quick Reference Guide
- Downtime Transfusion of Blood and Blood Components Reference Tool

Laboratory Medicine

Issues

Decreased productivity/throughput

- Variability/errors/ambiguity in paper requisitions
- Increased turnaround time for test results
- Inability to ensure prompt receipt of results to providers

Solutions

Updated downtime process

- Collected and phased out old paper requisitions
- Created new, simplified paper requisitions
- Standardized process for delivery of lab results during downtime

Lab Solutions

- Limited menu of lab orders created during a downtime
- Formalize support agreements from neighboring institutions to help process labs

Pharmacy Operations

Issues

Delays in Medication orders and delivery

- Lack of medication tracking
- Medication safety
- Staff overworked and exhausted

Solutions

Review and increase resource utilization

- Established dedicated phone line for stat orders and requests
- Revised medication request process
- Increased number of fax machines
- Created an electronic database to track new order entries, refills and label generation

Prescription Pads

- Process created to distribute pads
- Information on how prescribers can fill out prescription pads.

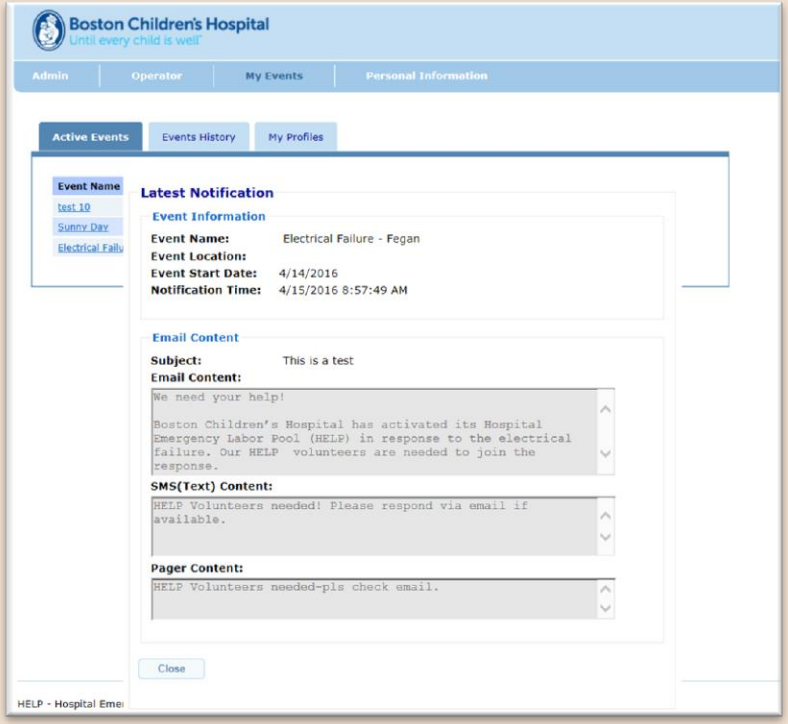
Lessons Learned: Staffing

- More staff needed
  - In many different departments
  - For a multitude of tasks
  - In all phases of response

…There's an App for that

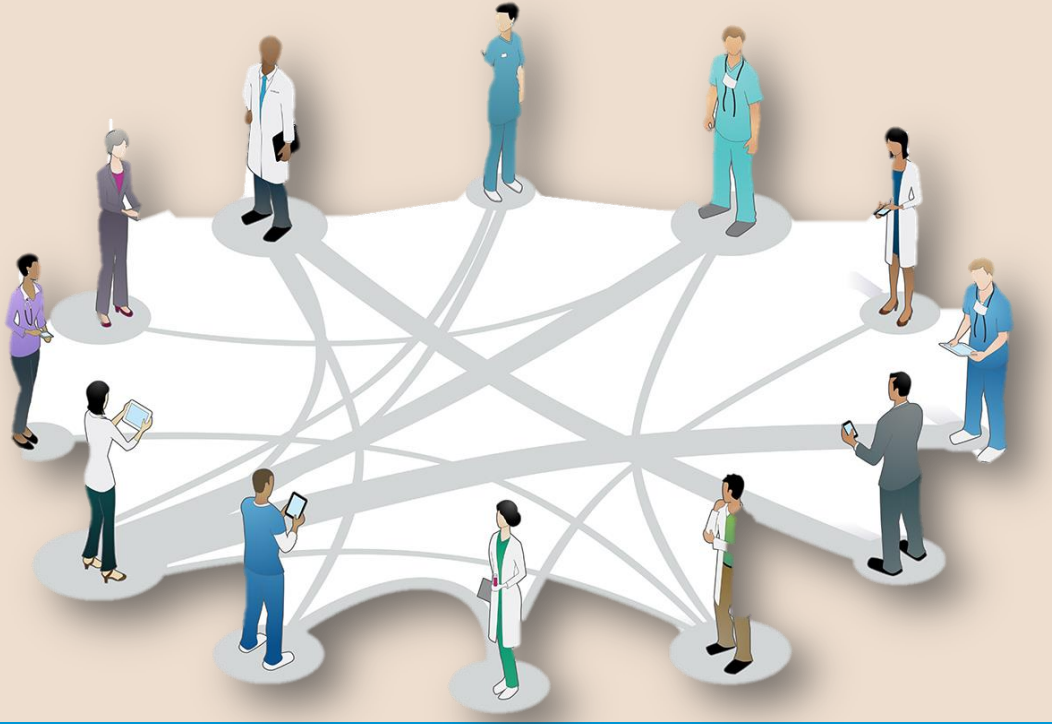
Hospital Emergency Labor Pool

When activated the “HELP” application can query staff availability for multiple operational shifts.



Lessons Learned:

Communication



Communication Feedback

After surveying hospital staff after a 5 day downtime communication was the **number one opportunity for improvement.**

Feedback included:

- Need for increased frequency of communication
- Stronger leadership presence during long term activations
- Visible leadership on the floors
- More transparency and coordination within messaging

Communication Insights

- **Employee heroics vs system capabilities:** Cumulative system and human stressors
- **Marshalling Senior Clinical Leadership** Committee guidance early and often
- **Making capacity management decisions** – balancing safety, quality, access, and employee considerations
- **Internal and external communication** – media, employees, and patients & families
  - Creation of an emergency family education sheet to distribute during an emergency.

Action Items

Risk Communication training given to incident commanders.	Response tools compiled of methods to communicate with staff	Ensure frequency of updates to all staff
Regular updates to senior leadership	Facilitate regular communication with IT response and HICS Command Center	Better ways to facilitate “town hall” meetings to reach large amounts of staff

Shift to High Reliability

- A cultural shift to focus on error prevention, transparency, and situational awareness
- 5 Principles:
  - Preoccupation with failure
  - Reluctance to simplify interpretations
  - Sensitivity to operations
  - Commitment to resilience
  - Communication at all levels

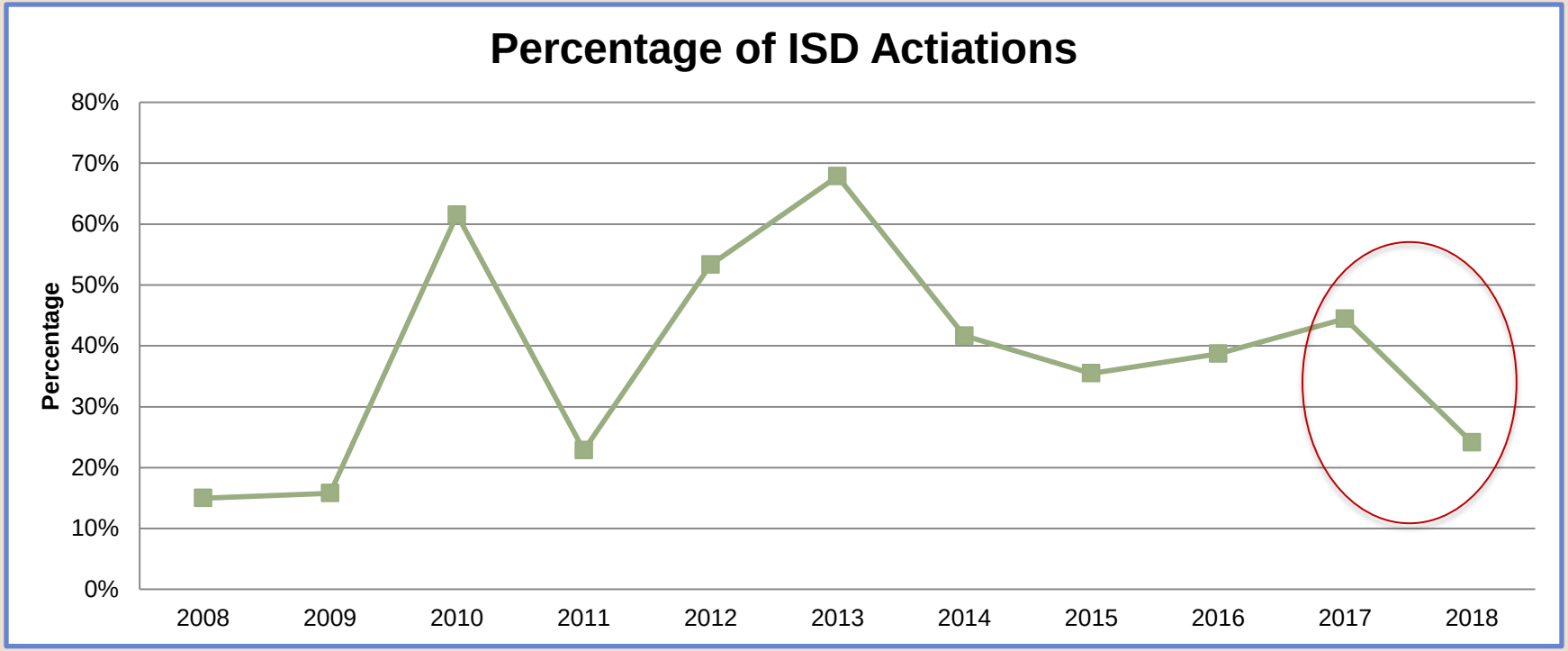
Goal: zero serious events of preventable harm

An enterprise-wide commitment to doing things right the first time, every time

System Resiliency

Move to Remote Hosting!

Current Environment



Questions?

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