


driving readiness in  
dynamic times

Disaster Planning for  
California Hospitals



## EHR Downtime and IT Triage — Strategies for Response and Recovery

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# EHR Downtime

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# Objectives



- Describe alternative electronic strategies developed for managing system outages
- Demonstrate procedure variations in emergency department and inpatient system outages
- Identify lessons learned from downtime implementation strategies


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## About UC Davis Medical Center

VIDEO

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## About UC Davis Medical Center (cont.)




### Emergency Department (ED)

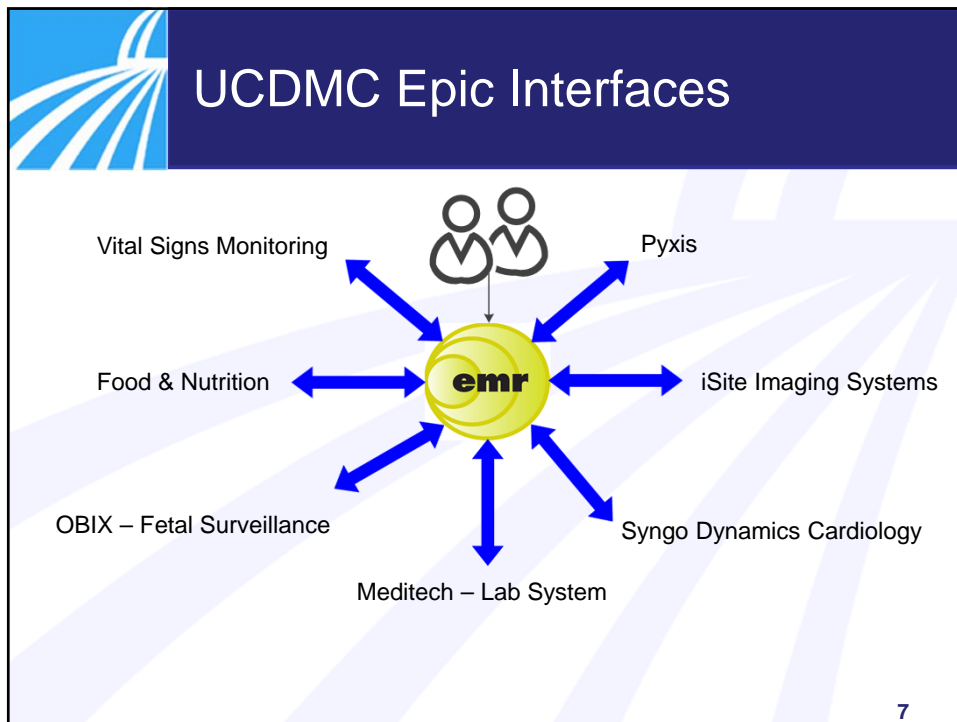
- 64 licensed beds
- 2015 census: 79,355 patients
- 30% of ED patients arrive via EMS daily
- 26% of ED patients require inpatient admit

### Labor & Delivery (L&D)

- 15 inpatient beds / 8 outpatient beds
- 2 operating room suites
- 1,790 births (fiscal year 2015-16)
- 4,729 triage visits (fiscal year 2015-16)




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- ## EHR Downtime Preparation
- Type of downtime
  - Communication plans
  - Current and scheduled patients
  - New patient arrivals
    - ▢ Emergency Department
    - ▢ Labor and Delivery
    - ▢ Laboratory – separate system
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## Types of Downtime


### Scheduled



- Pause – 1 to 3 minutes, scheduled 22:00 (low electronic medical record (EMR) utilization)
- Scheduled maintenance – typically monthly 02:00 – 05:00


### Unscheduled

- EHR
- Supporting systems (e.g., network, server)



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## Scheduled Communication Plan




- Managed by IT EHR Lead and Technology Operations Center (TOC)
- Group email sent to predetermined clinical managers at least two weeks prior
- Pre-prepared response reminders

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## Unscheduled Communication Plan

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- Managed by TOC
- Pre-prepared response actions personalized for current event



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## Portal Notification

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**SECURE LOGIN**

**PhysicianConnect**

A Web-based electronic medical record (EMR) system

There is a planned downtime for PhysicianConnect on 8/22/2010 from 1 to 5:30 AM

 **CLICK HERE TO LOGIN**

New user? Click here.

- Frequently asked questions
- Customer service
- Terms and conditions (PDF)

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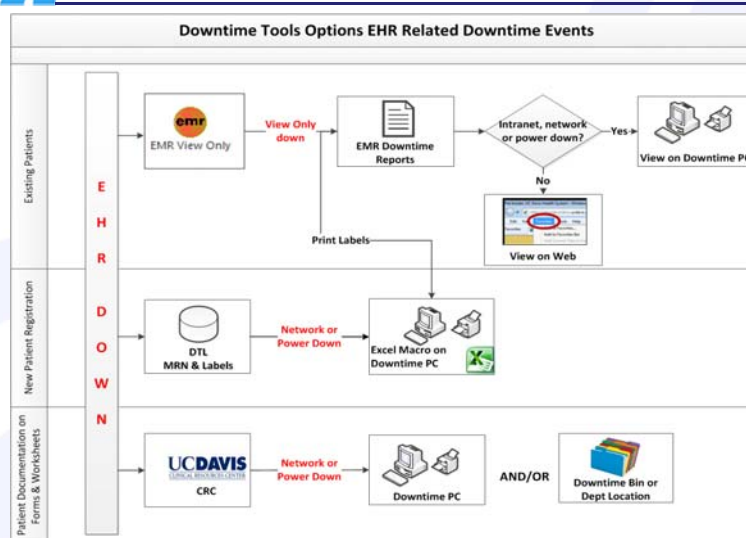


## EHR Downtime Response Strategies

- Current and scheduled patients
- New patient arrivals
  - ▢ Emergency Department
  - ▢ Labor and Delivery
  - ▢ Laboratory – separate system

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## Downtime Response Overview



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## Current and Scheduled Patients – Primary Strategy



EMR View-Only

**ELECTRONIC MEDICAL RECORD**

**Epic**

Epic 2012 Shadow

User ID:


Password:

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 U.S. Patents 5,781,091 and 5,301,105. Other patents issued and pending.  
 Additional copyrights apply. CPT10, copyright AMA, SNOMED CT © copyright IHTSDO. More

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## Current and Scheduled Patients – Secondary Strategy



EMR Downtime Reporting

**Business Continuity Access Login**

User ID:

Password:

**Select Reports**

Current Reports

Hold down Ctrl key and click to select multiple reports.

Title	Created	Printed	Report Type	Patient	MRN	Unit	Print Selected
KARDEX Report - CSN 22144626	8/5/2008 10:45 AM		KARDEX RL	Xotestcoe1...	3344626	T2 SURGL...	2
MAN Report - CSN 22144628	8/5/2008 10:45 AM		MAN Report	Xotestcoe1...	3344628	T2 SURGL...	2
KARDEX Report - CSN 22144640	8/5/2008 10:45 AM		KARDEX RL	Xotestcoe1...	3344640	T2 SURGL...	2
MAN Report - CSN 22144642	8/5/2008 10:45 AM	8/5/2008...	MAN Report	Xotestcoe1...	3344642	T2 SURGL...	2
KARDEX Report - CSN 22144634	8/5/2008 10:45 AM		KARDEX RL	Xotestcoe1...	3344634	T2 SURGL...	2
MAN Report - CSN 22144636	8/5/2008 10:45 AM		MAN Report	Xotestcoe1...	3344636	T2 SURGL...	2
KARDEX Report - CSN 22144637	8/5/2008 10:45 AM		KARDEX RL	Xotestcoe1...	3344637	T2 SURGL...	2
MAN Report - CSN 22144637	8/5/2008 10:45 AM		MAN Report	Xotestcoe1...	3344637	T2 SURGL...	2
KARDEX Report - CSN 22144775	8/5/2008 10:32 AM		KARDEX RL	Xotestcoe1...	3345273	T2 SURGL...	2
MAN Report - CSN 22144775	8/5/2008 10:32 AM		MAN Report	Xotestcoe1...	3345273	T2 SURGL...	2


You can Sort by clicking MRN or any other column header.

Use the scroll bar to view additional columns.

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## Current and Scheduled Patients – Anytime Access to Reports

When EMR View Only isn't available, patient information available via the intranet.

Hospital

Ambulatory

**UC DAVIS**  
HEALTH SYSTEM

Business Continuity Web Access

Please use your EMR Hyperspace login credentials to log in

User ID:

Password:

Log In

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## New Patient Arrival System

**Downtime Label Printing**  
**PROD**

[Home](#) || [Search Patients](#) || [Add a New Patient](#) || [Reports](#)

Search Patients


Add a New Patient

Reports



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## New Patient – Label Printing



**Downtime Label Printing**
Health Info  
logged in

[Home](#) | [Search Patients](#) | [Add a New Patient](#) | [Reports](#)

**Enter a New Encounter for Stockton2, Davis (6000088)**

\*Encounter Date: 06/12/2014

\*Encounter Type: ED Arrival

\*Department: EMERGENCY - PAVILION

\* indicates required field

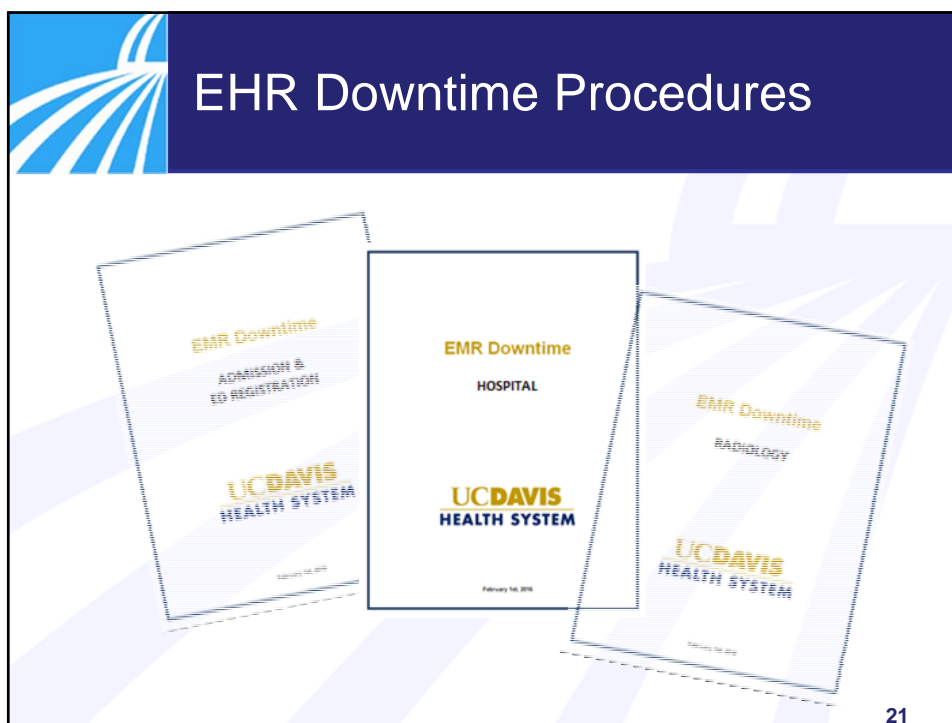
**List of Open Encounters for Stockton2, Davis (6000088)**

☐ = in EMR ☐ = not in EMR yet

CSN	Encounter Date	Encounter Type	Printer	Copies
800000000083	06/12/2014	ED Arrival	6T0682	1

## When All Else Fails

	A	B	C	D	E	F	G	H	I	J	K	L	M
1	Last, First					This tab is for ED Registration and New admissions only							
2	Gender	Female											
3	DOB												
4													
5													
6													
7	<b>INSTRUCTIONS:</b>												
8	1. Place the next sheet of downtime pre-numbered MRN/CSN labels into the printer.												
9	2. Type the patient LAST name, FIRST name in the name cell.												
10	If the patient name length exceeds the space provided, type the * symbol in the last visible space to												
11						This tab is for Inpatient, OR, PACU, ED (before outage) Only							
12	MRN:												
13	Last, First:												
14	Gender:	Female											
15	DOB:												
16	CSN:												
17													
18	<b>Instructions:</b>												
19	1. Place a blank sheet of downtime labels (Order #) in the printer.												
20	2. Complete all cells by <u>carefully</u> typing patient information:												
21	MRN is 7 numbers.												
22	Enter patient name using LAST, FIRST format.												



## Downtime Forms and Worksheets

UC DAVIS  
CLINICAL RESOURCES CENTER

**HOME** | CHEMO ORDERS | CHRONIC DISEASE | DRUG USE GUIDELINES | **EMR DOWNTIME** | EMR ORDER SETS | Select Tab...

**Downtime Procedures**  
System Unavailability Manual

**EMR Downtime Reports**  
Ambulatory Downtime Reports  
Hospital EMR Downtime Reports

**Administrative Worksheets**  
Admission Downtime Form  
Admission from a HSD Form

3130 Form  
Adult Nutrition Assessment  
ADH Clinic Flowchart  
Anticoagulation Clinic Referral  
Apheresis Procedure Record - Leukopheresis-page 2  
Anesthesia Procedure Record - RAC Perfusion

**Laboratory**  
Inpatient Lab Requisition  
Laboratory Recovery Worksheet  
HD Bridge Patient Registration Form  
HD Bridge Shipping Manifest  
Outpatient Laboratory Requisition  
Patient Lab Registration Downtime Form

**Nursing**  
24 HR Restraint Flow Sheet & Plan of Care  
Ambulatory-ED Patient Medication List  
Birthing Suite Triage Note  
Delivery Worksheet  
ED Charge Nurse Downtime & Recovery Checklist  
ED Downtime Patient Tracking Log  
ED Downtime Triage Record  
Fetal Health Assessment  
HSD Sedation Flowchart  
Impella 2.5 Circulatory Support System Flow Sheet  
MAS-PEN Meds  
MAS-Scheduled Meds  
Nurses Progress Record  
Nursing/Pharmacy Communication  
Obstetrics Telephone Encounter  
OPD - Medication Refill-Problem Sheet  
Perinatal Antepartum Flowchart  
PICC Dressing Change Note  
Pre-Operative Checklist  
Pre-Procedure Checklist  
Preprocedure - Cardiovascular Intervention  
Sedation/Procedure Record  
Sepsis Protocol During an EMR Downtime - Response  
Telephone Encounter  
VAD Patient Education  
Vital Signs Report

**Physician**  
Ambulatory-ED Patient Medication List  
CPEU Consult/Observation/Admission Form  
ED Admission Report

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## Downtime Response Process

### Downtime Forms Available:

- Online Clinical Resource Center
- Downtime computers
- Bins/drawers for specialty forms

Paper orders labeled by unit and called/sent to fulfilling department

Pyxis machines on override, so manual registration required

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## Results During Downtime

- Critical labs called
- All labs auto-faxed to unit (some exceptions)
- Images available via Citrix Images icon



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# Department Variations

EMR Downtime

LABOR AND DELIVERY

UCDAVIS  
HEALTH SYSTEM

February 1st, 2016


EMR Downtime

EMERGENCY DEPARTMENT

UCDAVIS  
HEALTH SYSTEM

February 1st, 2016

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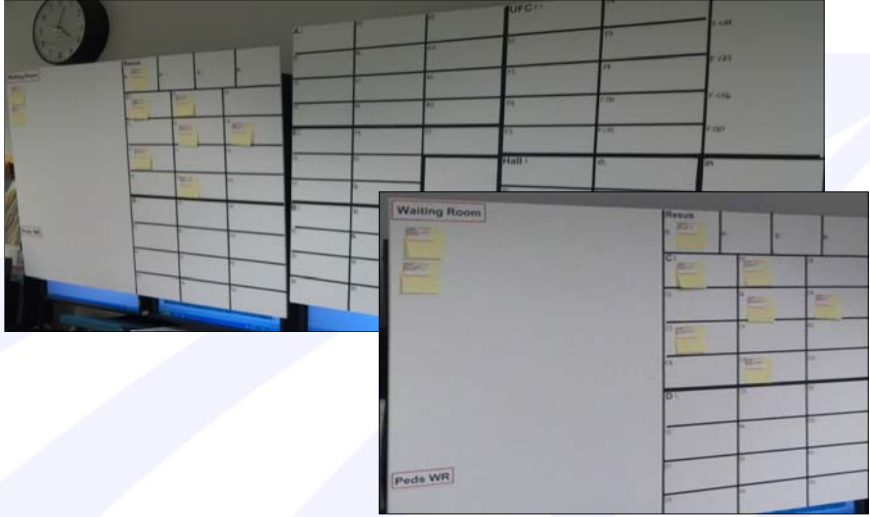
# Internal Triage Monitors



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## Downtime Internal Triage Board



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## EHR Recovery Process

Goal: minimize non-clinical (administrative) recovery period

Utilize email group and checklists

Group members

- Bed control
- Hospital access services
- Laboratory
- System integration
- EMR technical team (coordinates)

One hour allocated for standard monthly outages



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## Recovery Phase I – Admissions/Discharges/Transfers

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Recovery mode only available to select group of EHR users



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## Recovery Phase II – Clinical

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### Clinical references

- System Unavailability Row in Vital Signs flow sheet
- System Unavailability Note in the Notes activity – information automatically populates within the note
- Ensures coders capture services for billing

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## Recovery Phase II – Clinical (cont.)

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Medications removed from Pyxis console  
reconciled with medication administration  
record (MAR)

Newborns may require manual linking to  
mother

Laboratory and imaging results  
auto-populate via interfaces

Scanned paper documentation available on  
the EMR Media tab – flags in system

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## Recovery Phase II – Clinical (cont.)

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ED visits that begin and complete during  
downtime are scanned

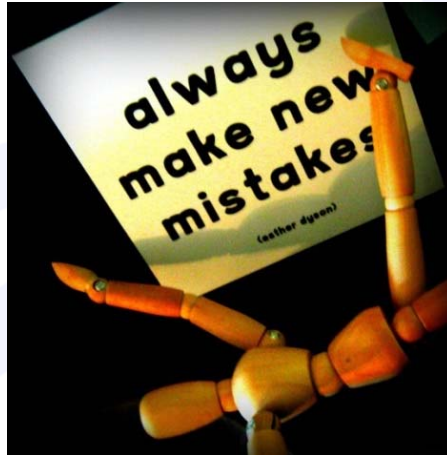
ED to L&D – ED visit recorded in EHR;  
downtime visit documented by L&D



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## Lessons Learned



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## IT Triage: One-Stop Shop for Disaster Response and Recovery





## Objectives

- Identify factors incorporated into acuity level for an IT application
- Describe how to apply the database for everyday use and in all phases of emergency management
- Identify important data fields needed for your site and how they interrelate

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## About Mercy Medical Center

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- Located in Redding, California
- Level II Trauma Center
- 256 licensed beds
- 57,650 ER visits annually
- 190 applications
- 1,700 staff (hospital)
- Multiple off-site clinics



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## Quote of the Day

***If necessity is the mother of invention ...***

***... confusion is frequently the offspring of disaster response.***



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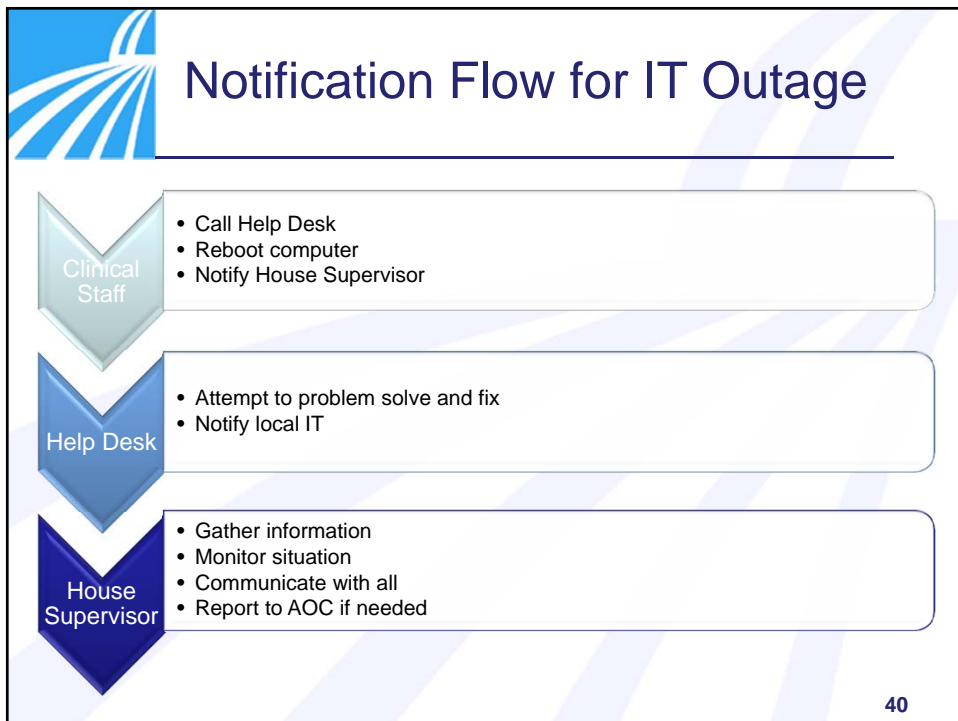
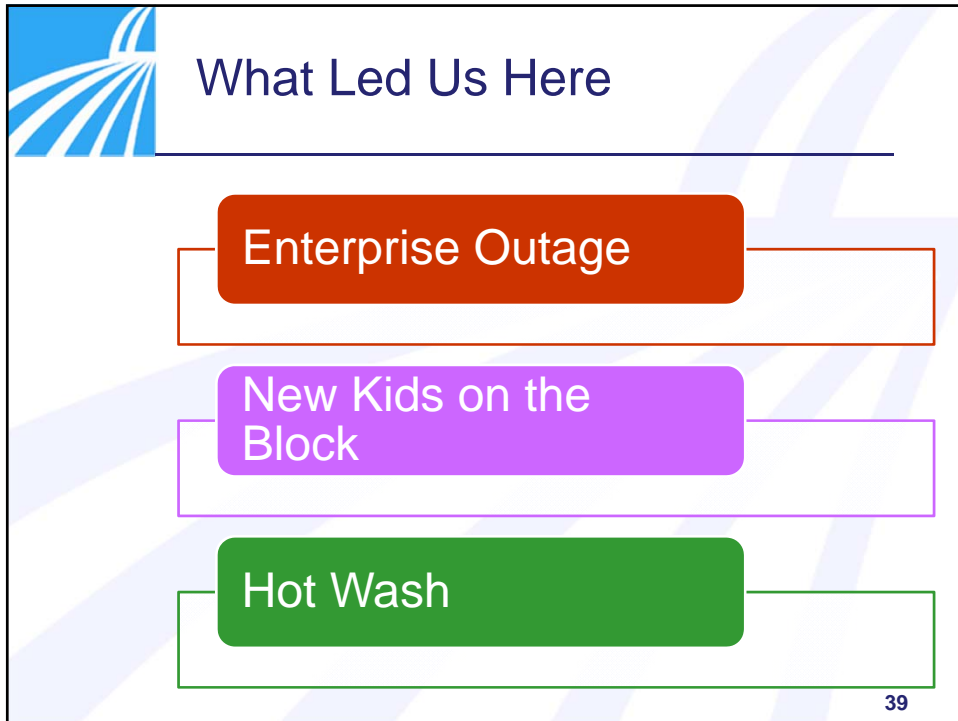
## Show Me the Money

- IT downtime cost: \$8,000+/minute\*
- Average downtime cost: \$740,000/outage\*
- Average cost of home in California: \$464,200+
- Three outages a year and you get ...




\*Source: Ponemon Institute, Jan. 2016  
\*Source: zillow.com

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Original State

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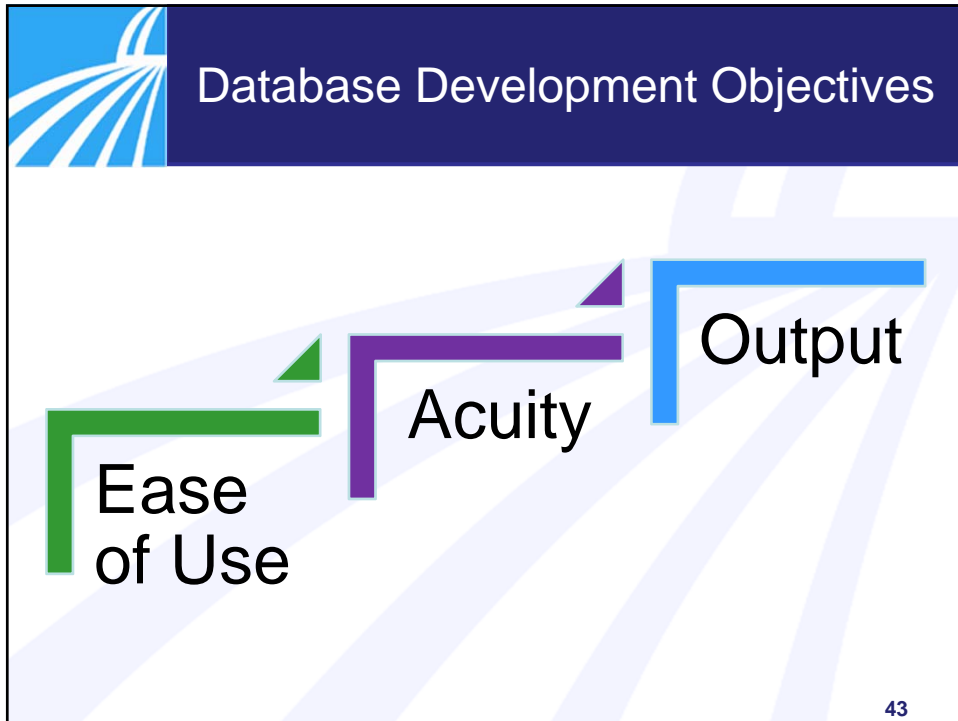


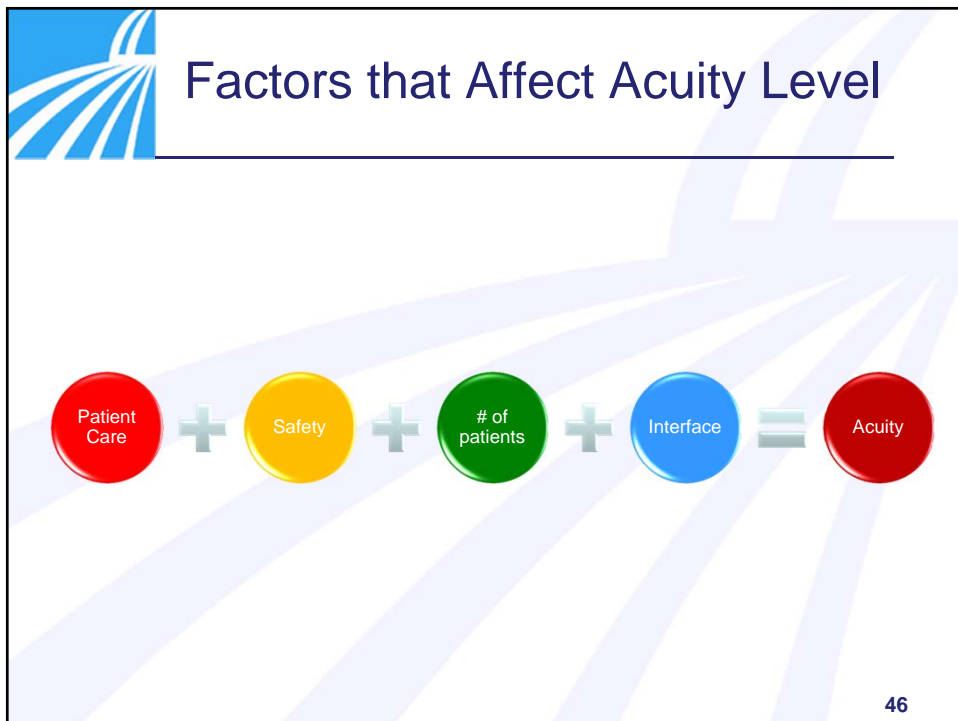
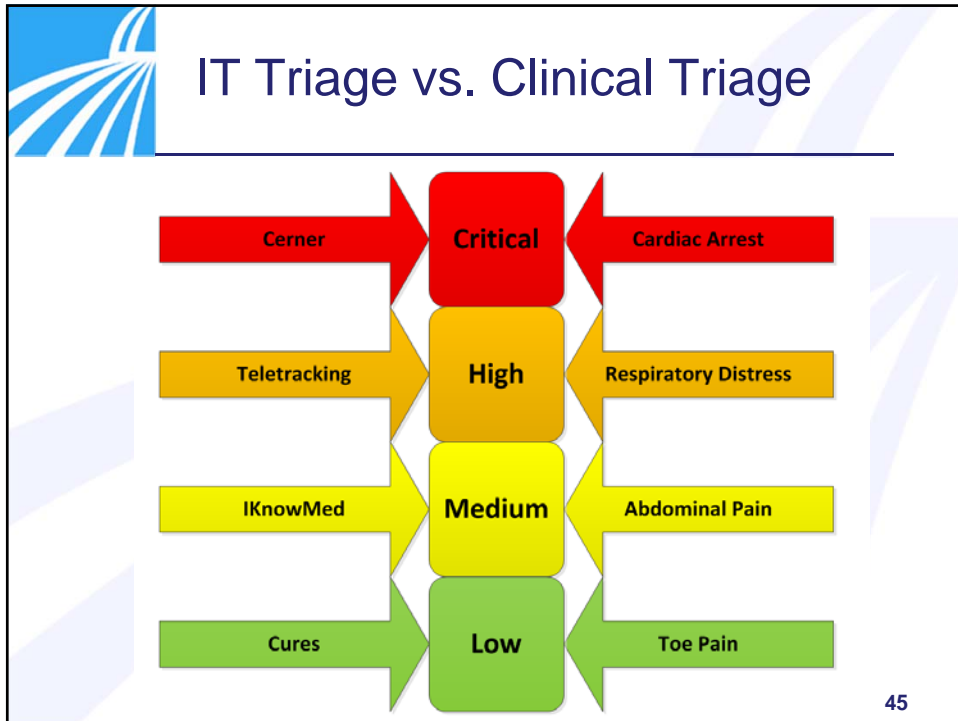
Design Collaboration

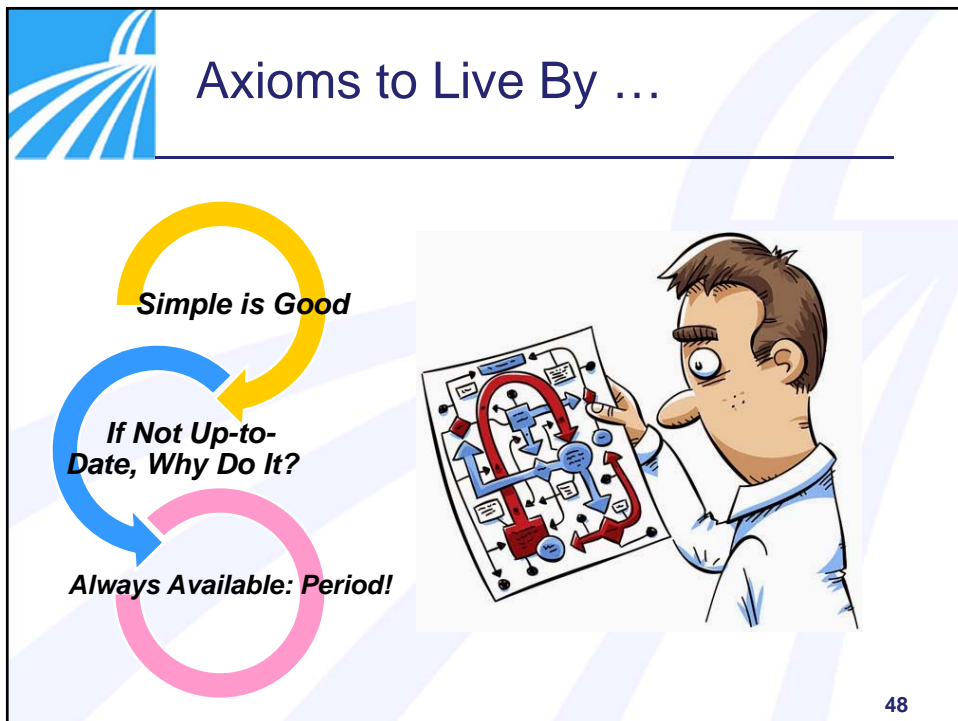
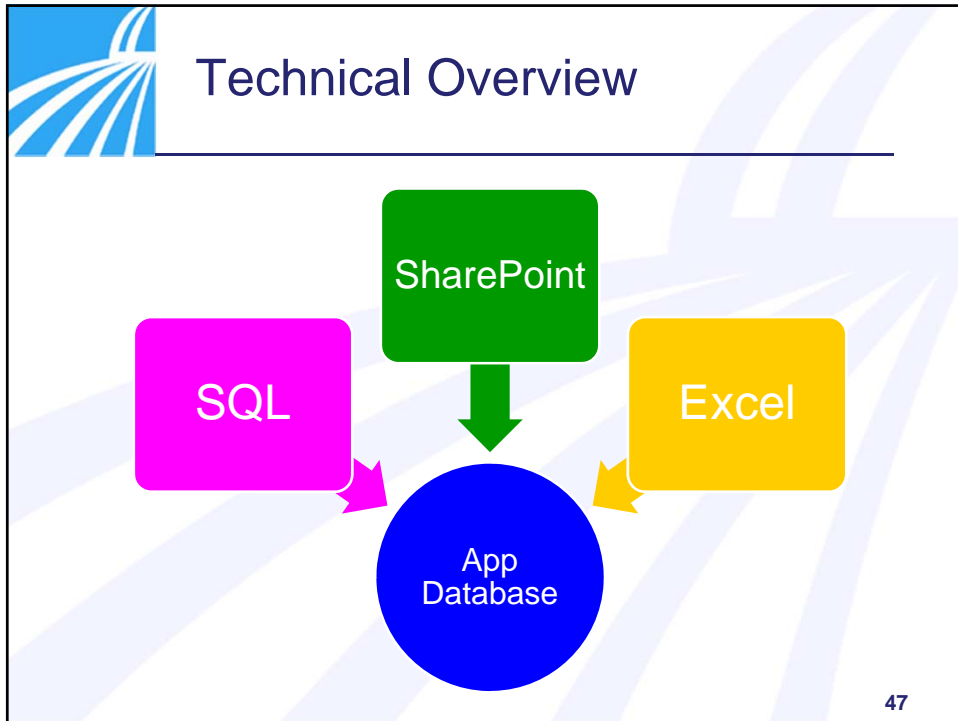
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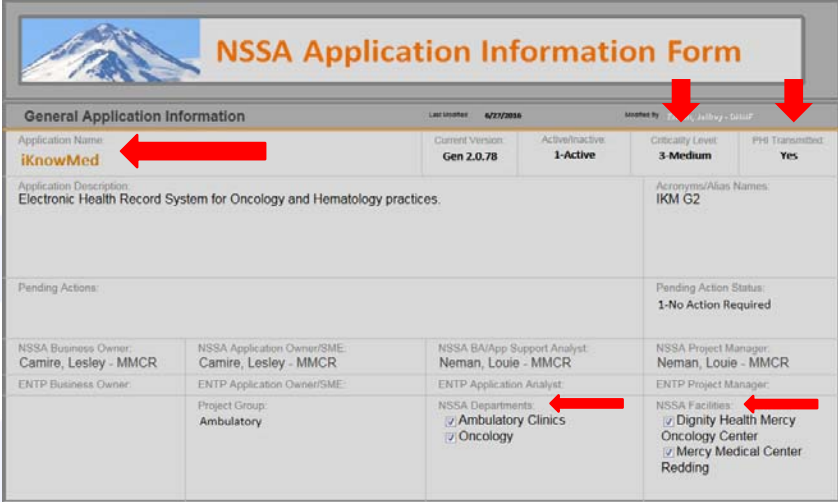
# Mercy Redding's Solution

## Let's Take a Look!

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# Application Sample



**NSSA Application Information Form**

General Application Information		Last Modified: 6/27/2016	Modified By: [Red Arrow] [Name] - [Name]	[Red Arrow]
Application Name: <b>iKnowMed</b> [Red Arrow]	Current Version: <b>Gen 2.0.78</b>	Active/Inactive: <b>1-Active</b>	Criticality Level: <b>3-Medium</b>	PHI Transmitted: <b>Yes</b>
Application Description: <b>Electronic Health Record System for Oncology and Hematology practices.</b>			Acronyms/Alias Names: <b>IKM G2</b>	
Pending Actions:			Pending Action Status: <b>1-No Action Required</b>	
NSSA Business Owner: <b>Camire, Lesley - MMCR</b>	NSSA Application Owner/SME: <b>Camire, Lesley - MMCR</b>	NSSA BA/App Support Analyst: <b>Neman, Louie - MMCR</b>	NSSA Project Manager: <b>Neman, Louie - MMCR</b>	
ENTP Business Owner:	ENTP Application Owner/SME:	ENTP Application Analyst:	ENTP Project Manager:	
	Project Group: <b>Ambulatory</b>	NSSA Departments: [Red Arrow] <b>Ambulatory Clinics</b> <b>Oncology</b>	NSSA Facilities: [Red Arrow] <b>Dignity Health Mercy Oncology Center</b> <b>Mercy Medical Center Redding</b>	

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## Application Sample (cont.)

---

Application Support Information			
Support Type: <input checked="" type="checkbox"/> Facility Support <input checked="" type="checkbox"/> Vendor Support	Dignity Support Team Name: NSSA IT BA Team	Dignity Support Team Contact: NSSA-IT Analyst Team <NSSA-ITA...	Dignity Support Contact Phone: 530.247.34 [REDACTED]
	Vendor Support Phone: 888.338.8445	Vendor Support Hours: 24/7	Client ID:
	Vendor After Hours Support Phone: Same	Maintenance Agreement Exists: 1-Yes	Maintenance Agreement Term: 3 - Annual
Maintenance Agreement Start Date: 2/13/2014	Maint. Agreement End Date: 2/13/2016	Maintenance AU: 151.829340	Maintenance Costs: \$34,800
Maintenance Notes: Automatically renews yearly			

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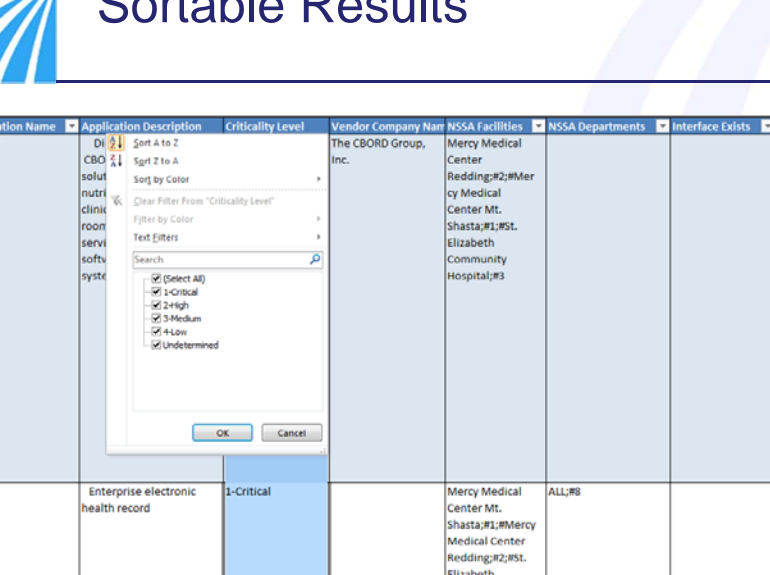
## Application Sample (cont.)

---

Application Technical Information				
Server Details:				
<u>Server Name:</u>	<u>Location:</u>	<u>Rack Location:</u>	<u>IP Address</u>	<u>OS:</u>
PHX-VAPP-318	PHX EDC	VC-503 (Grid)	10.248.5.61	32 Bit 2007 Server Standard SP2
<b>Server Notes:</b> NSSA BA team has access into this Server. Lynx Mobile Interface Listener that is installed on this server needs to continually run in order to receive data from IKM and IKM Hosting Location (ASP).				
Test Server Details:				
<u>Server Name:</u>	<u>Location:</u>	<u>Rack Location:</u>	<u>IP Address</u>	<u>OS:</u>
PHX-VAPP-321	PHX EDC	VC-503 (Grid)	10.248.5.233	32 Bit 2007 Server Standard SP2
<b>Server Notes:</b> NSSA BA Team has access into these servers. IKM only has one connection to hosting site so if Test System is turned on then that'll take down the Prod Environment				
Interface Exists: 1-Yes	Interface Type: <input checked="" type="checkbox"/> ADT <input checked="" type="checkbox"/> HL-7	Source Application(s): <input checked="" type="checkbox"/> Centricity Business <input checked="" type="checkbox"/> PathNet <input checked="" type="checkbox"/> RadNet	Destination Application(s): <input checked="" type="checkbox"/> iKnowMed <input checked="" type="checkbox"/> MobileMD	

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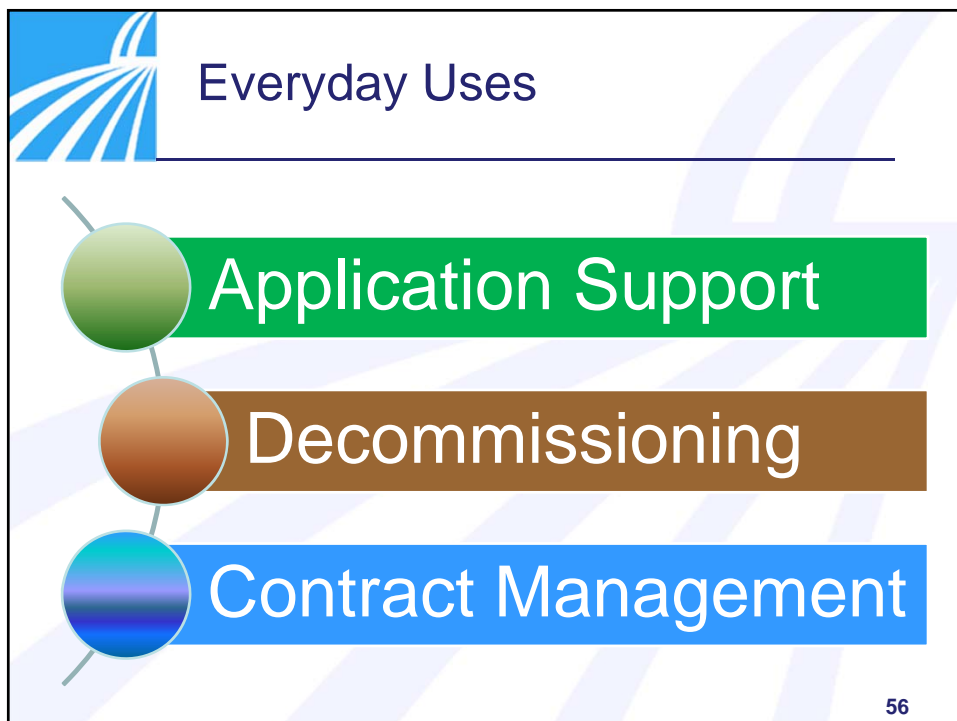
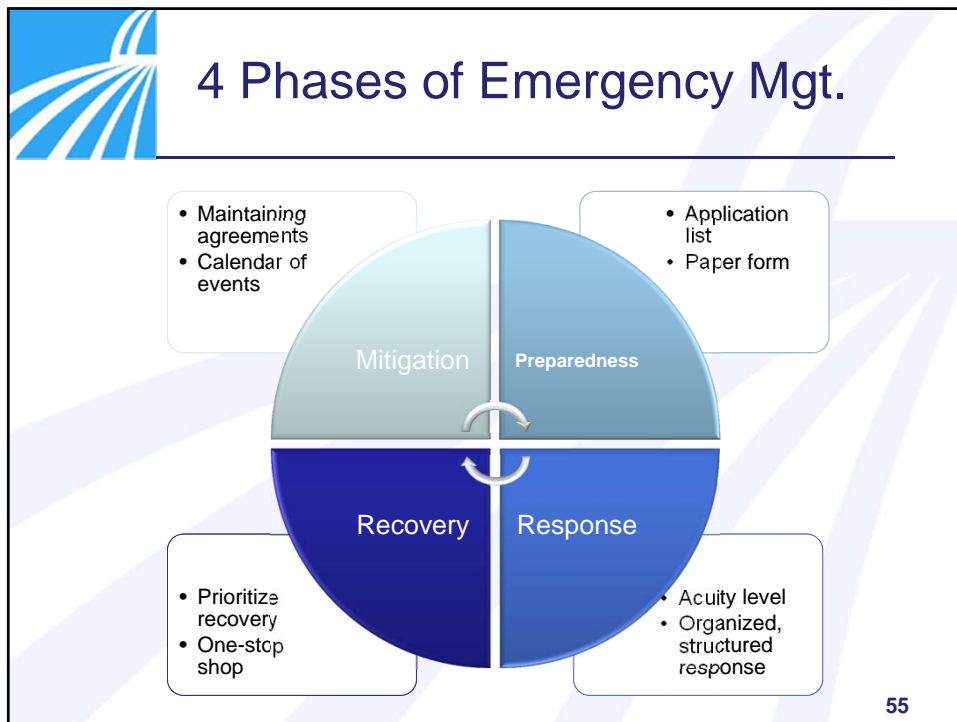



# Sortable Results

Application Name	Application Description	Criticality Level	Vendor Company Name	NSSA Facilities	NSSA Departments	Interface Exists
CBORD	<div> <div> Sort A to Z  Sort Z to A  Sort by Color  Clear Filter From "Criticality Level"  Filter by Color  Text Filters  Search  <input checked="" type="checkbox"/> (Select All)  <input checked="" type="checkbox"/> 1-Critical  <input checked="" type="checkbox"/> 2-High  <input checked="" type="checkbox"/> 3-Medium  <input checked="" type="checkbox"/> 4-Low  <input checked="" type="checkbox"/> Undetermined </div> <div>OK Cancel</div> </div>		The CBORD Group, Inc.	Mercy Medical Center Redding;#2;#Mercy Medical Center Mt. Shasta;#1;#St. Elizabeth Community Hospital;#3		
Cerner	Enterprise electronic health record	1-Critical		Mercy Medical Center Mt. Shasta;#1;#Mercy Medical Center Redding;#2;#St. Elizabeth Community Hospital;#3	ALL;#8	




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[illegible]









# Remember This?



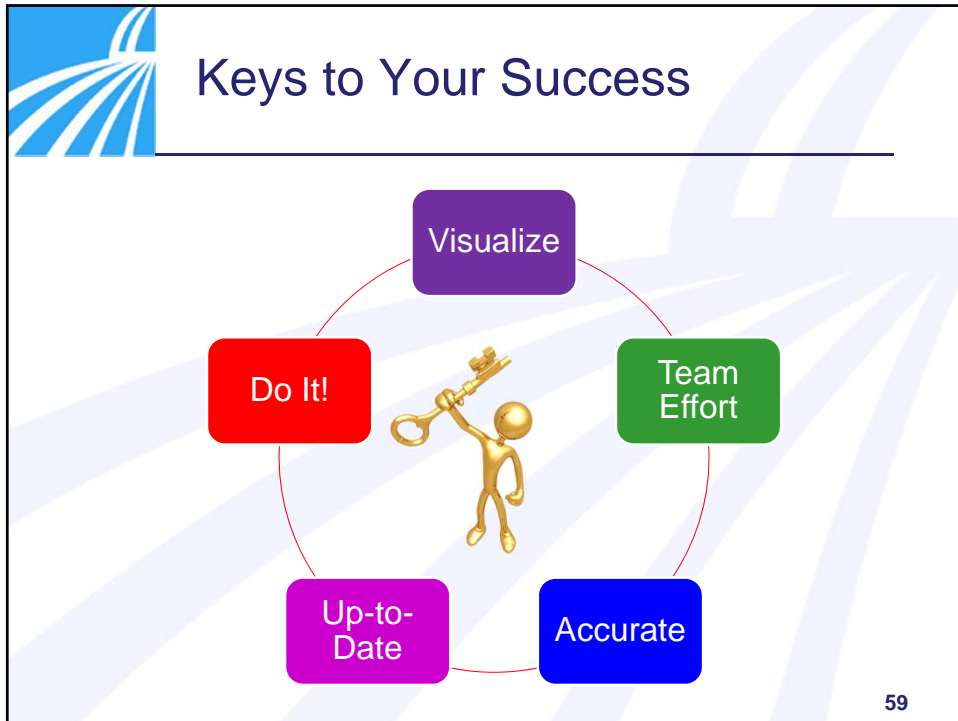
57



# Current State




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## Final Thought

***“All great changes are preceded by chaos.”***



***– Deepak Chopra***

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## Sources

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- **Ponemon Institute**
  - [www.emersonnetworkpower.com/en-US/Resources/Market/Data-Center/Latest-Thinking/Ponemon/Documents/2016-Cost-of-Data-Center-Outages-FINAL-2.pdf](http://www.emersonnetworkpower.com/en-US/Resources/Market/Data-Center/Latest-Thinking/Ponemon/Documents/2016-Cost-of-Data-Center-Outages-FINAL-2.pdf)
- **Zillow.com**
  - [www.zillow.com/ca/home-values/](http://www.zillow.com/ca/home-values/)
- **Mercy Redding Database Programmer**
  - **Chad Webb, Project Manager III – Dignity Health**

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## Questions?



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## Thank You!

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