



The Office of the National Coordinator for
Health Information Technology

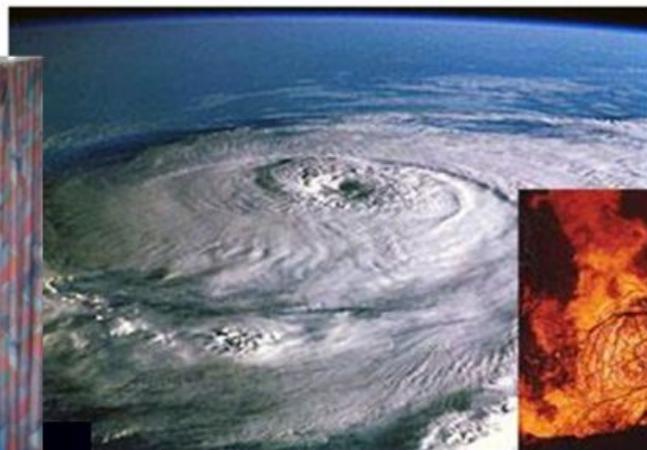
PULSE, EMS and HIE—A Federal, State and Private Sector Perspective on Disaster Response

Thursday, November 29, 2018



Why are we all here?

Preparedness, response and recovery are a shared responsibility



dailymail.com

Presenters

- Mariann Yeager, The Sequoia Project
- Leslie Witten-Rood and Dan Smiley, California EMS Authority
- Christy Revels, North Carolina Department of Information Technology
- Thomas Novak, CMS/ONC



The Office of the National Coordinator for
Health Information Technology

Patient Unified Lookup Service for Emergencies

Supporting a Nationwide Disaster Response System

Mariann Yeager, CEO | The Sequoia Project



Patient Unified Lookup Service for Emergencies



What Does PULSE Do?

Provides authorized disaster healthcare volunteers access to health records to treat patients seeking care in alternative care facilities

How Does PULSE Work?

- **Disaster healthcare volunteers log in**
- **Volunteers authenticated**
- **Volunteers retrieve records from connected networks**
- **Clinicians use information to treatment patients in shelters**

PULSE Advisory Council

- Nora Belcher, Texas e-Health Alliance (TEHA)
- Rim Cothren - California Association of Health Information Exchange (CAHIE)
- Tara Cramer Georgia Regional Academic Community Health Information Exchange (GRACHIE)
- Kristen Finne, HHS Assistant Secretary of Preparedness and Response (ASPR)
- Dan Smiley, California Emergency Medical Services Authority (CalEMSA)
- Lee Stevens, HHS Intergovernmental and External Affairs
- Sean Turner, Dignity Health
- Leslie Witten-Rood, California Emergency Medical Services Authority (CalEMSA)
- Jeremy Wong, Audacious Inquiry (Ai)

Patient Query



Peter Fisher ▶

Search

Review

Patient Query

First Name *

Steve

Last Name *

Hardy

Gender *

Male

Date of Birth *

April

1

1963

SSN

XXX-XX-XXXX

Search Q

Queries (0)

Queried Patient Information

No current queries

Patient Staging

Patient Staging

gencie

Queried Patient Information

Name	Gender	Date of Birth
Steve Hardy	M	04/01/1963

Possible Patient Records

Location	Name	Gender	Date of Birth	SSN	View Details	Select
Mock Clinic Facility 1	Steve James Hardy	Male	04/01/1963	999-88-6345	<input type="button" value="Q"/>	<input checked="" type="checkbox"/>
Mock Hospital Facility 1	Steve James Hardy-Smith	Male	04/01/1963	999-88-6345	<input type="button" value="Q"/>	<input checked="" type="checkbox"/>
	Steve Jim Hardy	Male	04/01/1963	999-89-3300	<input type="button" value="Q"/>	<input type="checkbox"/>
Mock Hospital Facility 2	Steve James Hardy	Male	04/01/1963	999-88-6345	<input type="button" value="Q"/>	<input checked="" type="checkbox"/>
	Jim Steve Hardy	Male	04/01/1963	999-89-3300	<input type="button" value="Q"/>	<input type="checkbox"/>
Mock IDN Facility 1	James Steve Hardy-Smith	Male	04/01/1963	999-88-6345	<input type="button" value="Q"/>	<input checked="" type="checkbox"/>
Mock IDN Facility 2	James Steve Hardy-Smith	Male	04/01/1963	999-88-6345	<input type="button" value="Q"/>	<input checked="" type="checkbox"/>

Combined PULSE Patient

Full Name *	<input type="text" value="Steve Hardy"/>	Friendly Name	<input type="text"/>
Gender *	<input type="text" value="Male"/>	SSN	<input type="text"/>
Date of Birth *	<input type="text" value="April"/>	<input type="text" value="1"/>	<input type="text" value="1963"/>

status
7 rec
SERVICES AUTHORITY
WA

Document List



Contra Costa-01

Peter Fisher

Log Out

Show Location Status

Search

Review

Patient: John Smith

John Smith

Edit Discharge Deactivate

Gender M

Date of Birth Jun 5, 1966

SSN

Status	Title	Class Name	Confidentiality	Creation Date	Size	Location
	Hospital Admission	ALLERGY NOTE	High	May 15, 2008	34.6 kB	St. Sebastian's Hospital
	Hospital Admission	ALLERGY NOTE	High	May 15, 2008	34.6 kB	Santa Rosa Mental Health Institute
	Physical Test	SUMMARIZATION OF EPISODE NOTE	Normal	May 15, 2008	34.6 kB	St. Sebastian's Hospital



Patient Unified Lookup System for Emergencies

Contra Costa-01

Peter Fisher

Log Out

Show Location Status

ALLERGIES, ADVERSE REACTIONS, ALERTS

Type	Substance	Reaction	Status
ALLERGIES	morphine	rash	Active
ALLERGIES	amoxicillin	anaphylaxis	Active
ALLERGIES	metronidazole	difficulty breathing	Active
ALLERGIES	Macrolide Antibiotics Group	nausea	Active

MEDICATIONS

Medication	Start Date	Route	Dose	Status
Abilify, „[RxNorm:352309]	20150102000000			Active
Crestor, „[RxNorm:859749]	20150101000000			Active
Sucraid, „[RxNorm:213337]	20150217000000			Active
Dilantin, „[RxNorm:855871]	20150216000000			Active

PROBLEMS

1. Alteration in Mood[Status-Active]

- Government incubation provides foundation for the nation
- Nationwide deployment grounded by real-world experience
- Disaster response drives and accelerates interoperability
- Standardize nationally and tailor only where necessary locally
- Interoperability is improving state of readiness



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For more information

<https://sequoiaproject.org/pulse/>



@ONC_HealthIT



@HHSOHC

HealthIT.gov 

PATIENT UNIFIED LOOKUP SYSTEM FOR EMERGENCIES (PULSE)

State of California
Emergency Medical Services Authority

Dan Smiley and Leslie Witten-Rood



Patient Unified Lookup System for Emergencies (PULSE)

- **Idea/concept originated from experiences during Hurricane Katrina**
- **April 2014 - ONC published a report that assessed opportunities in CA and Gulf Coast to use HIE to support Disaster preparedness and EMS.**
 - » **1) EMS data exchange with hospitals**
 - » **2) disaster response medical history portal (PULSE)**
- **May 2014 - ASPR and ONC received a \$50,000 grant from HHS IDEA Lab to establish the core technical approach/requirements, scope of work and use cases (scenarios) for PULSE**
- **July 2015 - California EMSA received funding from ONC to design, build and implement PULSE**

PULSE GOALS



- ✓ **Deliver patient health information to healthcare professionals during a disaster**
- ✓ **Improve patient care**

PULSE Steps

✓ Design

✓ Build

✓ Connect

✓ Implement

✓ Deploy

PULSE

Patient Unified Lookup System for Emergencies

Document Review: Continuity of Care Document

Clinical Summary

Patient	Daisy Zztest Gm
Language	(JPN)
Date of birth	November 10, 1935
Sex	Female
Race	
Ethnicity	Not Hispanic or Latino
Contact info	Primary Home: 55555 west county Road SAN FRANCISCO, CA 94115, USA Tel: +1-999-888-8888
Patient IDs	SUF9819508 13238505
Confidentiality	Normal
Document Id	
Document Created:	April 5, 2018, 12:44:20, MST
Author	Epic - Version 8.3
Contact info	
Emergency contact (Mother)	zztest, Mom
Contact info	Tel: +1-999-888-9099
Emergency contact (Father)	zztest, Father
Contact info	Tel: +1-999-777-0765

PULSE DESIGN

Patient Target Populations:

- **Disaster victims who need medical treatment or medication refills**
- **All victims experiencing a medical or trauma emergency**
- **Displaced Victims of Disasters outside of their normal health system or geographic area of service**



PULSE DESIGN

Providers Target Populations:

- **Healthcare professionals**
- **Working in a:**
 - » Mobile Field Hospital or Alternate Care site
 - » Medical Shelter
 - » EMS setting



California PULSE Pilot Design

- **Emergency or Disaster Occurs**
- **Request is made to EMSA to Activate PULSE**
- **EMSA Activates PULSE through the PULSE Operator**
- **DHV Volunteer can log into PULSE from DHV System (single sign-on through DHV website)**
- **Access to patient information for 4 Health Information Organizations**
- **6 types of Licensed Volunteers can log into PULSE when its activated by EMSA :**
 1. Physician
 2. Nurse Practitioner
 3. Pharmacist
 4. Registered Nurse
 5. Physician's Assistant
 6. EMT / Paramedic

PULSE BUILD

- Audacious Inquiry
- ONC Grant 2015-2017
- Scalable nationwide
- Portal built for access to **SEARCH** for patient health information during disaster situations

The screenshot displays the PULSE (Patient Unified Lookup System for Emergencies) interface. The top left features the PULSE logo and tagline. The top right shows the user name 'Peter Fisher'. Below the logo are two buttons: 'Search' (green) and 'Review' (blue). The main area is divided into two panels. The left panel, titled 'Patient Query', contains several search criteria: 'First Name *' (text input), 'Last Name *' (text input), 'Gender *' (dropdown menu), 'Date of Birth *' (Month, Day, and Year dropdowns), 'SSN' (text input with mask 'xxx-xx-xxxx'), 'Street Address' (text input), 'City' (text input), 'State' (dropdown menu), 'Zipcode' (text input), and 'Telephone' (text input). A 'Search Q' button is at the bottom of this panel. The right panel, titled 'Queries (1)', shows 'Queried Patient Information' in a table format. The table has columns for Name, Date of Birth, Gender, Last Updated, Status, and Action. One record is shown: Daisy ZZTEST GM, 11/10/1935, F, Apr 5, 2018 12:37:04 PM, with a status of '1 record found' and action buttons for '+' and 'x'.

Name	Date of Birth	Gender	▼ Last Updated	Status	Action
Daisy ZZTEST GM	11/10/1935	F	Apr 5, 2018 12:37:04 PM	1 record found	+ x

SEARCH for Patient

Required Fields: Name, Gender, DOB, (SS# or Address)

Search

Review

Patient Query

First Name *

First Name

Field is required

Last Name *

Last Name

Field is required

Gender *

Choose from the selection

Field is required

Date of Birth *

Month Day yyyy

Field is required

Field is required

Field is required

SSN

XXX-XX-XXXX

Street Address

City

State

Zipcode

State

Telephone

Search Q

Queries (1)

Queried Patient Information

Name	Date of Birth	Gender	Last Updated	Status	Action
Daisy ZZTEST GM	11/10/1935	F	Apr 5, 2018 12:37:04 PM	1 record found	+ ↺

CONNECT

Connect HIEs so that providers and emergency responders have a way to access health information across systems

- » Respond to disasters
- » Improve Clinical Decision Making
- » Improve patient health and
- » Measure outcomes

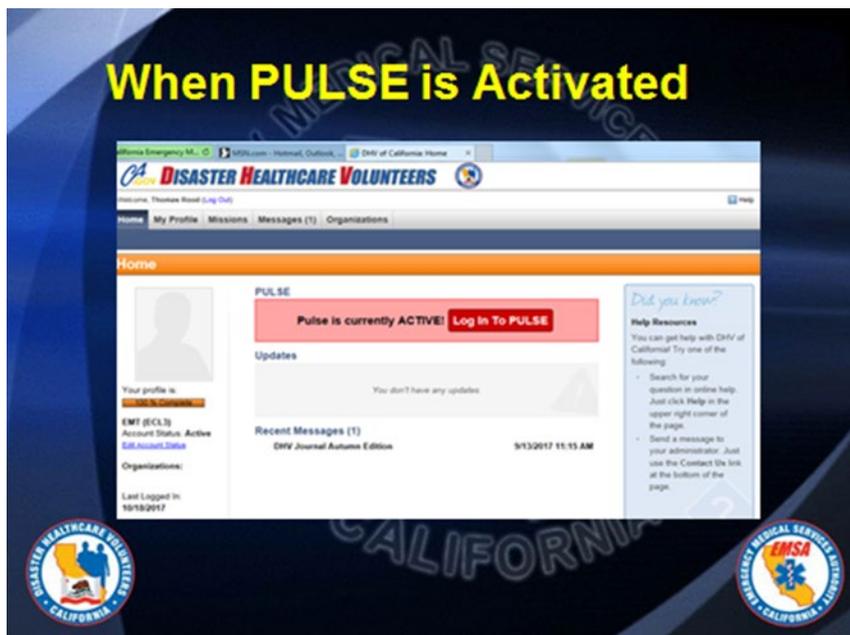
Interoperability



June 2017 PULSE Table Top Drill

- **Test the PULSE System**
- **Ensure connections with four health information organizations (HIOs)**
 1. OCPRHIO
 2. Santa Cruz HIE
 3. Sutter Health
 4. UC Davis Health
- **Testing connectivity of the DHV System (Vendor Intermedix & Directory Services as part of the California Trusted Exchange Network (CTEN), operated by CAHIE**
- **Received end user feedback from the Sacramento Medical Reserve Corps and Sacramento County**

Fall 2017 PULSE Implementation



- Roles & Responsibilities
- Develop Workflow
- Update Key Planning & Deployment Documents
- Communication
- Train end users
- Asset Request Process
- Deployment

Return of Patient Match(es)

Patient Staging ✕

Queried Patient Information

Name	Gender	Date of Birth
Daisy ZZTEST GM	F	11/10/1935

Possible Patient Records

Location	Name	Gender	Date of Birth	SSN	View Details	Select
Sutter Health	Daisy Zztest Gm	Female	11/10/1935			<input type="checkbox"/>

Combined PULSE Patient

Full Name *

Friendly Name

Gender *

SSN

Date of Birth *

 Dismiss

Save 

Return of Patient Encounters

Peter Fisher



Search

Review

Patient: Daisy ZZTEST GM



Daisy ZZTEST GM

[Edit](#) [Discharge](#) [Return to patient list](#)

Gender	F
Date of Birth	11/10/1935
SSN	

Status	Title	Class Name	Confidentiality	Creation Date	Size	Organization
	Hospital Encounter Summary	Progress Note	Normal	Apr 5, 2018	-1.0 B	Sutter Health
	Office Visit Summary	Progress Note	Normal	Apr 5, 2018	-1.0 B	Sutter Health
	Office Visit OB Est Summary	Progress Note	Normal	Apr 5, 2018	-1.0 B	Sutter Health
	Office Visit Summary	Progress Note	Normal	Apr 5, 2018	-1.0 B	Sutter Health
	Hospital Encounter Summary	Progress Note	Normal	Apr 5, 2018	-1.0 B	Sutter Health
	Office Visit Summary	Progress Note	Normal	Apr 5, 2018	-1.0 B	Sutter Health
	Office Visit Summary	Progress Note	Normal	Apr 5, 2018	-1.0 B	Sutter Health
	Hospital Encounter Summary	Progress Note	Normal	Apr 5, 2018	-1.0 B	Sutter Health
	Hospital Encounter Summary	Progress Note	Normal	Apr 5, 2018	-1.0 B	Sutter Health
	AC Care Management Summary	Progress Note	Normal	Apr 5, 2018	-1.0 B	Sutter Health

Return of Patient Information



Contra Costa-01

Peter Fisher

Log Out

Show Location Status

Search

Review

Patient: John Smith

John Smith

✎ Edit ✖ Discharge ✖ Deactivate

Gender

M

Date of Birth

Jun 5, 1966

SSN

Status	Title	Class Name	Confidentiality	Creation Date	Size	Location
+	Hospital Admission	ALLERGY NOTE	High	May 15, 2008	34.6 kB	St. Sebastian's Hospital
+	Hospital Admission	ALLERGY NOTE	High	May 15, 2008	34.6 kB	Santa Rosa Mental Health Institute
-	Physical Test	SUMMARIZATION OF EPISODE NOTE	Normal	May 16, 2008	34.6 kB	St. Sebastian's Hospital
-	Physical Test	SUMMARIZATION OF EPISODE NOTE	Normal	May 16, 2008	34.6 kB	Santa Rosa Mental Health Institute

Return of CCD Information



Patient Unified Lookup System for Emergencies

Document Review: Continuity of Care Document

Clinical Summary

Patient	Daisy Zztest Gm
Language	(JPN)
Date of birth	November 10, 1935
Sex	Female
Race	
Ethnicity	Not Hispanic or Latino
Contact info	Primary Home: 5555 west county Road SAN FRANCISCO, CA 94115, USA Tel: +1-999-888-8888
Patient IDs	SUF9819508 13238505
Confidentiality	Normal
Document Id	
Document Created:	April 5, 2018, 12:44:20, MST
Author	Epic - Version 8.3
Contact info	
Emergency contact (Mother)	zztest, Mom
Contact info	Tel: +1-999-888-9099
Emergency contact (Father)	zztest, Father
Contact info	Tel: +1 888 777 8765

Specific Medical Information



Patient Unified Lookup System for Emergencies

Source Comments

This information has been disclosed to you from records protected by Federal confidentiality rules (42 CFR part 2). The Federal rules prohibit you from making any further disclosure of this information unless further written consent of the person to whom it pertains or as otherwise permitted by 42 CFR part 2. A general authorization for the release of medical or other information is NOT sufficient for this purpose. The Federal information to criminally investigate or prosecute any alcohol or drug abuse patient. Sutter Health Affiliates and Community Connect Practices - DEV

Allergies

Active Allergy	Reactions	Severity	Noted Date	Comments
2-Ethoxyethanol			01/09/2018	
A & D	Anaphylaxis	High	01/09/2018	
Bilberry	Cough	High	11/17/2017	
Latex			01/09/2018	
Hydrocodone-Acetaminophen			01/09/2018	
Peanut-Containing Drug Products	Anaphylaxis	High	04/18/2017	

Current Medications

Prescription	Sig.	Disp.	Refills	Start Date	End Date	Status
PROAIR HFA 108 (90 Base) MCG/ACT Oral Inhaler	Inhale 2 Puffs by mouth every 4 to 6 hours as needed Shake well.	1 Inhaler	0	03/19/2018		Active
Indications: Asthma, unspecified asthma severity, unspecified whether complicated, unspecified whether persistent						
furosemide (LASIX) 80mg Tab	Take Tab by mouth daily	1 30 Tab	0	03/19/2018	04/18/2018	Active
Indications: Asthma, unspecified asthma severity, unspecified whether						

First Activation of PULSE: Wildfires Statewide October through December 2017



- EMSA partnered with the Sequoia Project to increase Geographic Coverage for PULSE
- PULSE established a temporary connection to eHealth Exchange







Both Kaiser and Sutter Hospital had to be evacuated in Sonoma County

Second Activation of PULSE: July 2018 in Shasta and Lake County



EMSA partnered with Sequoia and CAHIE to onboard additional patient records for affected areas



- Sacvalley Medshare
- Dignity Health

July and August 2018 Wildfires

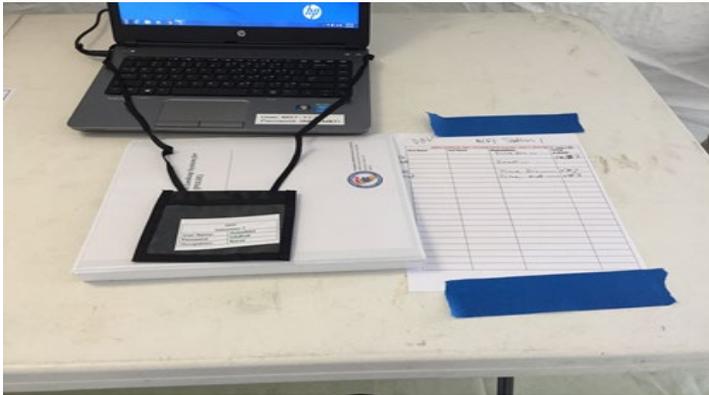
- **Northern California Medical Reserve Corps (MRC) supported local medical and health operations at the shelter.**
- **Contra Costa County MRC provided care in Lake County**



Norovirus outbreak at evacuation center



Training in PULSE – Exercised for 80 CAL-MAT/DHV Users



The exercise objective was to train CAL-MAT/DHV Providers on PULSE and to use the PULSE Asset while testing PULSE workflow in a disaster environment.

The Scenario used for the PULSE Exercise was a large scale earthquake in the Bay Area.





Third Activation of PULSE: November 2018 in Butte County



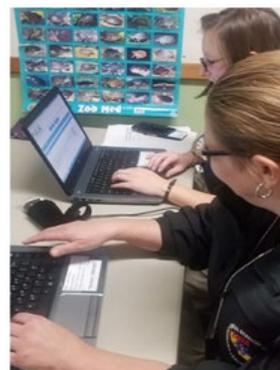
EMSA realized that use by medical personnel needed active deployment procedures



EMSA deployed a 3 member team to initiate PULSE and train personnel

Deploy PULSE

- Use in Camp Fire
- Eight locations
- Medical Component of Shelter
- EMSA sent team to initiate use
- CAL-MAT Team Members used PULSE for:
 - Patient History
 - Medical Refills





Leslie Witten-Rood Conducting Just-In-Time Training

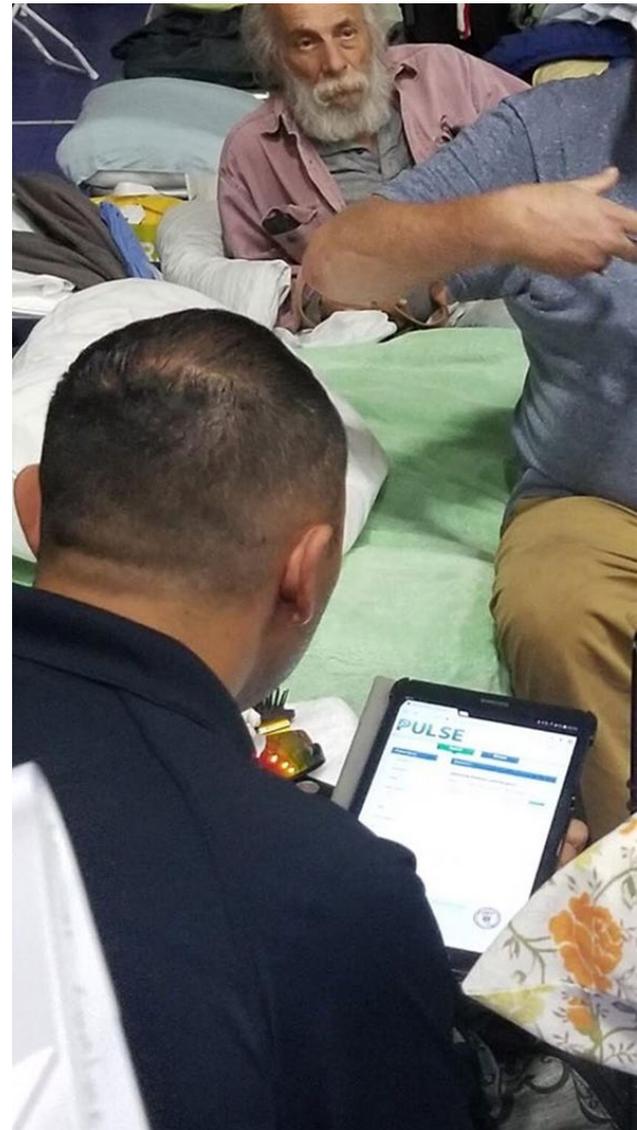
Medical Support Group

California Air National Guard 143rd
and 144th & California Army
National Guard's 297th



Patient Info Lookup

- **Continuity of Care Document (CCD) Info:**
- **Problem List**
- **Medications**
- **Allergies**
- **Help with Treatment**
- **Medication Refills**



Top 5 Goals from Lessons Learned

1. Statewide Coverage for PULSE

2. Just-in-Time User Registration

3. Deployment Team

4. Stable Internet Connections

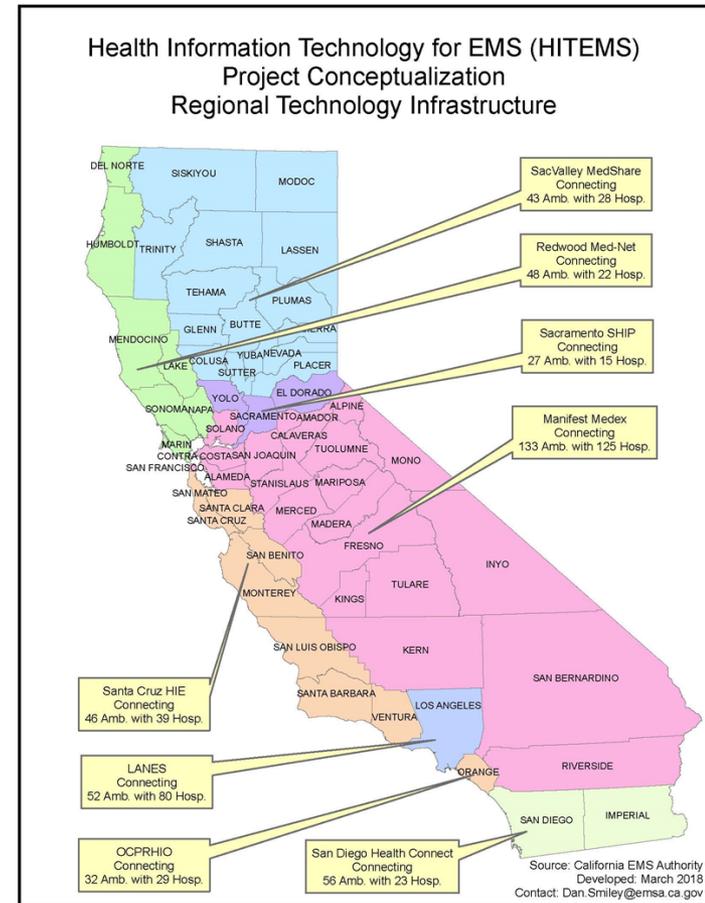
5. Sustainable Funding

- Consolidate all requested documents into a single report with provenance to improve review time
- Highlight within, or parse, C-CDA documents those data elements or fields most appropriate or more urgent for use in an emergency (most likely allergies, medications, problems, perhaps immunizations)

Onboard Additional HIOs

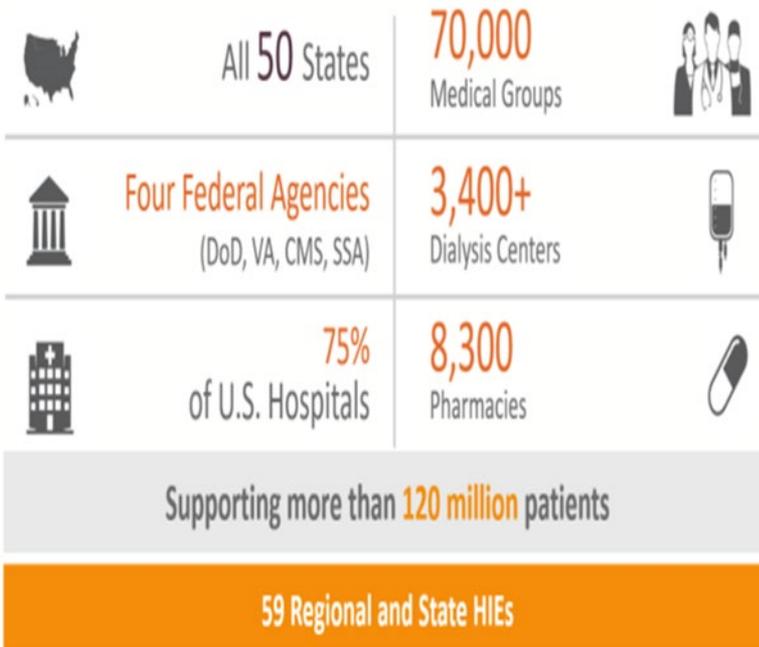
Current Connections

1. OCPRHIO
2. Santa Cruz HIE
3. Sutter Health
4. UC Davis Health
5. Sacvalley Medshare
6. Dignity Health



Next Steps Statewide Coverage

eHealth Exchange



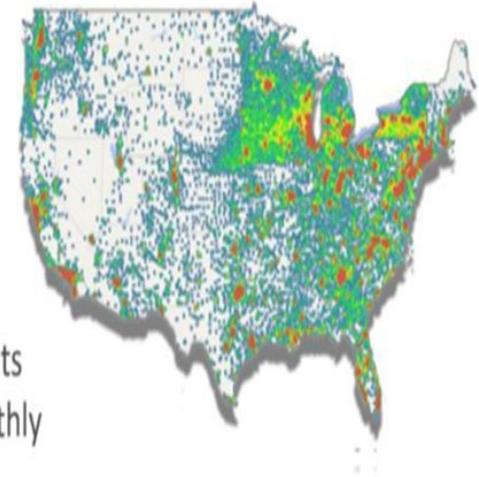
Carequality

34,700+ Clinics

1,250+ Hospitals

600K+ Providers

2M+ Clinical Documents
Exchanged Monthly





Next Steps

- **Medi-Cal (Medicaid) 90/10 Funding provided for PULSE Phase II identify contributors for matching funds**
- **Expand Care Plan Exchange for Disaster response adding additional HIE/HIOs**
- **Onboard to eHealth Exchange & Carequality**
- **Expand Capabilities of PULSE**
- **Expand DHV users to include hospital and EMS staff**
- **PULSE will stay in active state and the access control will be with the DHV Single Sign On (SSO)**
- **Enhance Deployment Capabilities**

Patient Unified Lookup System for Emergencies (PULSE)

- Questions?
- Contact:
- Leslie Witten-Rood
- leslie.witten@emsa.ca.gov
- Dan Smiley
- dan.smiley@emsa.ca.gov



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Leveraging Statewide HIE for Disaster Response

Lessons Learned at the North Carolina Health Information Exchange Authority

Christy Revels, Strategic Solutions | North Carolina Health Information Exchange Authority



About the North Carolina Health Information Exchange Authority (NC HIEA) and NC HealthConnex



We connect health care providers to safely and securely share health information through a trusted network to improve health care quality and outcomes for North Carolinians.



S T A T E - D E S I G N A T E D

North Carolina's state-designated health information exchange



S T A T E - M A N A G E D

Housed within the Department of Information Technology's Government Data Analytics Center (GDAC), the NC HIEA is a neutral party that is working to improve health across North Carolina.



P A R T N E R S H I P

Our technology partner is SAS Institute. Our partnerships include the NC Department of Health and Human Services, as well as provider and health care advocacy groups statewide.

Key Characteristics of NC HealthConnex

- The North Carolina Health Information Exchange Act dictates that:
 - » **All health care providers who receive state funds for the provision of health care services connect and submit demographic and clinical patient information at least twice daily to NC HealthConnex by dates in 2018-2021. This includes an estimated 98% of all health care providers statewide.**
 - » NC is an **opt-out state**; patients are automatically opted in until they tell us otherwise. **Our opt-out rate is >.01%.**

NC Medicaid Providers with Technology

- Hospitals
- Doctors
- Mid-Level Practitioners

LME/MCOs

Required to submit claims and encounter data

6/1/2018

6/1/2019

6/1/2020

6/1/2021

NC Medicaid & State Funded Service Provider without Technology

- All other providers

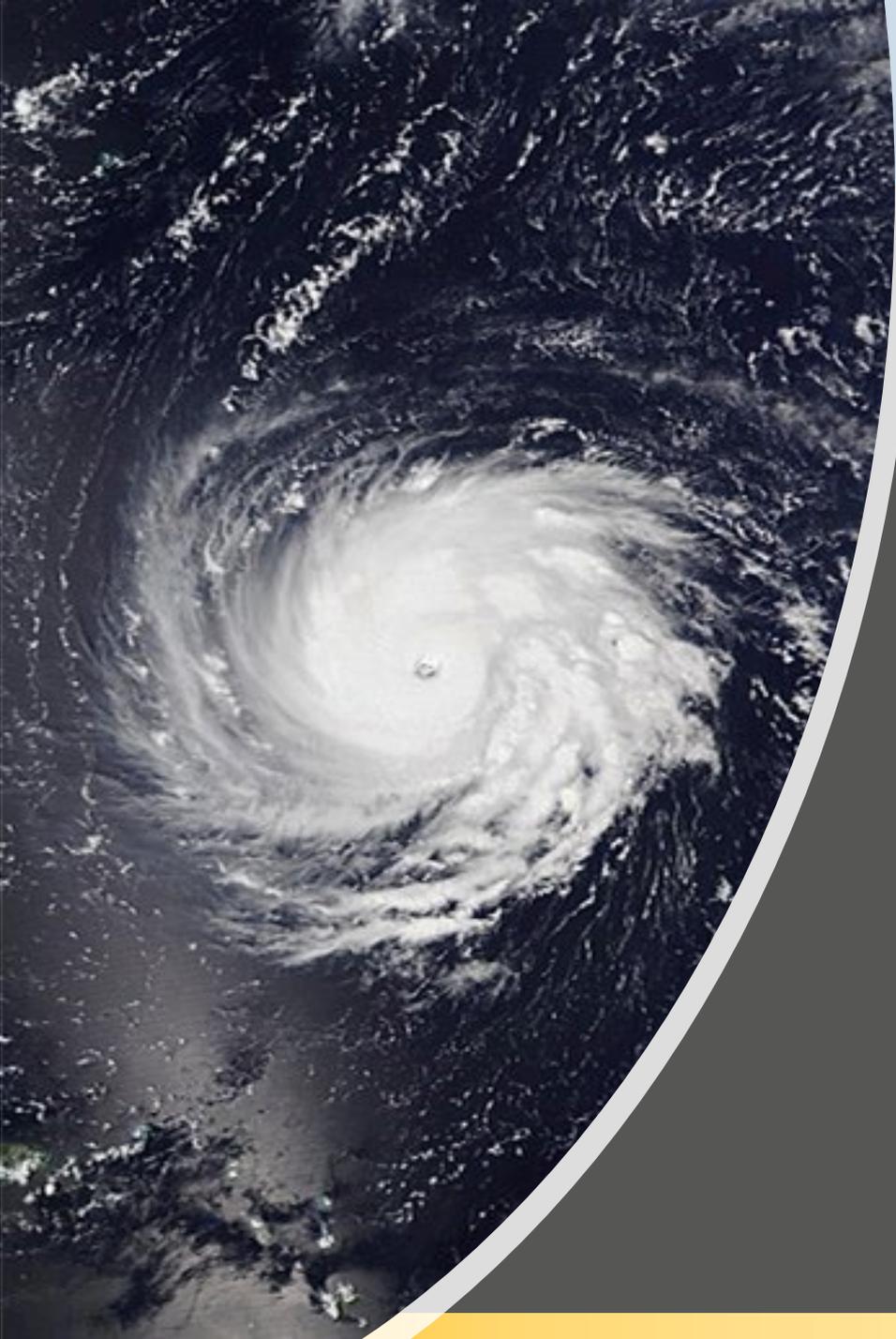
Required to Submit Clinical & Demographic Data

- Dentists
- Ambulatory Surgical Centers

Pharmacies

Required to submit claims data pertaining to State services once per day

- Around 8,000 participating facilities:
 - » 4,000+ facilities currently connected/live (up from 108 in early 2016)
 - » 3,900+ facilities currently in the onboarding process
 - » Over 6.3M unique patients, over 46,000 contributing providers
 - » Participants include, but not limited to:
 - 119 Hospitals
 - 163 Health Departments & FQHCs
 - 1,700+ Primary Care
 - 27 Rural Health Centers & Free Clinics
 - 2,300+ Specialists
 - 590+ Behavioral Health/IDD
 - 150+ Home Health
 - 90+ Eye & Dental
 - » Connected to eHealthExchange, and through it, seven other HIEs

A satellite image of a hurricane, showing a clear eye and spiral cloud bands. The image is positioned on the left side of the slide, separated from the text by a white curved line.

Hurricane's Coming...

- Leveraged eHealthExchange gateway to stand up rapid, bidirectional query and exchange connections to:
 - » Coastal Connect HIE (Wilmington, NC)
 - » etHIN (East Tennessee)
 - » GRACHiE (Augusta, GA)
 - » MedVirginia (Richmond, VA)
 - » SCHiEx (South Carolina)
- *Existing connections: GaHIN (GA's state-designated HIE) and VA VHIE (Veterans Administration)

During the Storm: Use Cases Emerge

- “Where are my patients?” Calls from health care providers/ organizations seeking assistance through HIE
 - » Large dialysis provider searching for over 100 patients who had missed treatments
 - » Drafted an Emergency Data Access and Use Agreement
- “Who is this patient?” Needs from state agencies and volunteer organizations seeking assistance through HIE
 - » Health care volunteers needed access to medical history when providing care in shelters and alternate care facilities

After the Storm: Integrating HIE with Disaster Preparedness

- Disaster preparedness in North Carolina spans hundreds of state agencies; NC HIEA has asked for a seat at the table
- Working with NC Department of Health and Human Services' Office of Emergency Medical Services
- Evaluating Patient Unified Lookup System for Emergencies (PULSE)
- Beyond patient lookup and access to patient history, how to enable health care volunteers to create records that would travel back to NC HealthConnex
- Accelerating effort to connect EMS providers



The Office of the National Coordinator for
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Thank You!

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@HHSOnc





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Leveraging State Medicaid Funding

Health Information Exchange to Support Disaster Preparedness and Response

Thomas Novak, ONC and CMS





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Questions?

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