



Health Information Exchange (HIE) Learning Series

HIE-105-EMS Application of HIE to Emergency Medical Services (EMS)

11/17/2014

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Agenda

- Benefits of HIE for EMS
- Quality Improvement
- ePCR and Electronic Health Records
 - NEMSIS 3 Data, NEMSIS Compliant, HL7
- EMS Core Measures and Metrics
- Make System Improvements
- Implementing Health Information Exchange
 - Field to CHIO to Hospital (and Back)



Course Overview/Purpose

The *Emergency Medical Services* course addresses the specific reasons and design considerations for implementing Health Information Exchange in EMS systems. The course will discuss NEMSIS and HL7 national standards for representation of EMS information, examine potential strategies for moving EMS data around, discuss barriers that must be overcome to implement HIE, EMS recommendations related to HIE, and finally discuss models and next steps which Emergency Medical Services may want to consider as it develops its data exchange strategy.



Health Information Exchange

- **Course Objective 1:** Briefly describe how HIE can be related to EMS



Health Information Exchange

- How is HIE related to EMS?
 - **Health Information Exchange allows health care professionals and patients to appropriately access and securely share a patient's vital medical information electronically.**

Electronic Exchange of Patient Information—What's in the Middle??



← AND MAGIC HAPPENS!! →




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Health Information Exchange

- **Course Objective 2:** Describe four reasons why Cal-EMSA trying to implement HIE related to EMS


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Connecting America for Better Health
 The Office of the National Coordinator for Health Information Technology

ARRA
(American Recovery and Reinvestment Act)

↓ includes

HITECH
(Health Information Technology for Economic and Clinical Health Act)

↓ implemented in

CMS Rule

- Defines **meaningful use** criteria
- Establishes incentive payments for meeting meaningful use criteria (and penalties for not meeting)

↔ alignment ↔

ONC Rule

- Establishes **certification criteria** that EHR technology will need to meet in order to support meaningful use


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Triple Aim of Health Care – Align EMS with Healthcare




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Quality Improvement Frameworks—Improve Patient Care

- IOM’s Six Aims for Improvement

1	Safe	Avoiding injuries to patients from the care that is intended to help them
2	Effective	Services based on scientific knowledge to all who could benefit
3	Patient Centered	Care that is respectful of and responsive to individual patient preferences, needs and values.
4	Timely	Reducing waits and harmful delays
5	Efficient	Avoiding waste of equipment supplies, ideas, and energy
6	Equitable	Care does not vary in quality because of gender, ethnicity, geographic location or income.


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EHRs Support Provider Decision Making

- EHRs can help providers make efficient, effective decisions about patient care, through:
- Improved aggregation, analysis, and communication of patient information
- Clinical alerts and reminders
- Support for diagnostic and therapeutic decisions
- Built-in safeguards against potential adverse events


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Disaster Preparedness

- Allow Patient Health Information to be available when patients are relocated
- Patient Tracking
- “Real-Time” Surveillance



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2013 HIE Project Goals

Cal-OHII Grant to EMSA

- August - Dec 2013
- \$300,000 Grant

Deliverables

- EMS Readiness Assessment for HIE (Lumetra)
- 3 Local Demonstration Projects
 - Monterey
 - Contra Costa County
 - Inland Counties EMS
- EMS and HIE Conference (Nov 2013)

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- Course Objective 3: Describe the Stages of HIE Readiness.
- What percentage of EMS Providers had ePCR capability in 2013?

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California HIE Readiness Assessment

Approximate Percentage of Agency Providers on ePCR or paper

Category	Percentage
ePCR	71%
Paper	29%

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California HIE Readiness Assessment

Stages	Definition
Stage 7	HIE functional, bidirectional sharing of data between the ePCR and hospital based EHR, business and clinical intelligence.
Stage 6	HIE capable, Transfer of data from the ePCR to hospital based EHR.
Stage 5	HIE capable, Advanced clinical decision support (on-line medical direction) through hospital Dashboard, proactive care management, and structured messaging.
Stage 4	ePCR transmission to Hospital Dashboard, including EKG, available at the hospital, receiving unidirectional information from the field "real-time".
Stage 3	ePCR entry, computers have replaced the paper chart for "real-time" data entry, clinical documentation and clinical decision support (pre-hospital protocols).
Stage 2	Beginning of a computerized data record (CDR), computers may be at point-of-care.
Stage 1	Desktop access to PCR information entered after the call, multiple data sources.
Stage 0	Paper chart based

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California HIE Readiness Assessment

Stages	Definition
Stage 7	HIE functional, bidirectional sharing of data between the ePCR and hospital based EHR, business and clinical intelligence.
Stage 6	HIE capable, Transfer of data from the ePCR to hospital based EHR.
Stage 5	HIE capable, Advanced clinical decision support (on-line medical direction) through hospital Dashboard, proactive care management, and structured messaging.
Stage 4	ePCR transmission to Hospital Dashboard, including EKG, available at the hospital, receiving unidirectional information from the field "real-time".
Stage 3	ePCR entry, computers have replaced the paper chart for "real-time" data entry, clinical documentation and clinical decision support (pre-hospital protocols).
Stage 2	Beginning of a computerized data record (CDR), computers may be at point-of-care.
Stage 1	Desktop access to PCR information entered after the call, multiple data sources.
Stage 0	Paper chart based

71% of EMS providers are at Stage 3 or above

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Describe what level your agency is at based on the 7 levels of EMS ePCR and HIE Adoption Model (more than one option may apply)

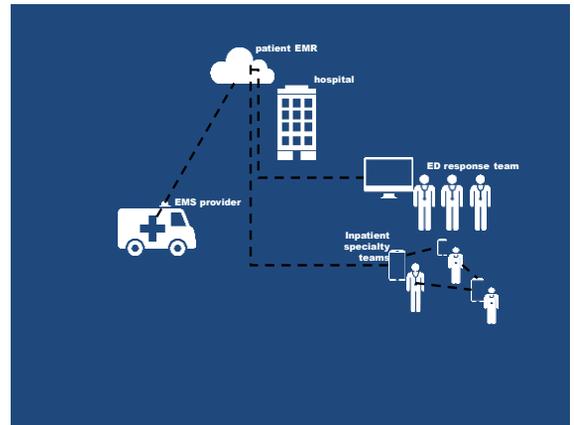
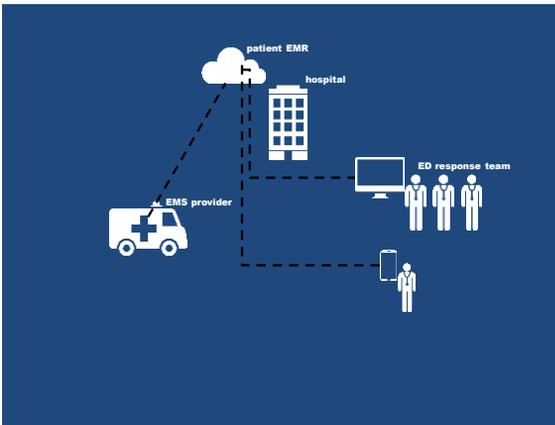
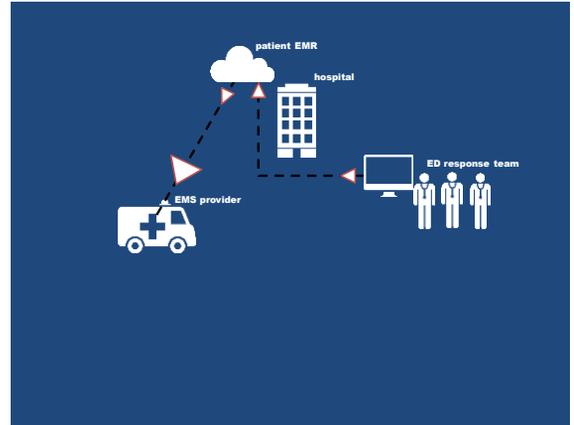
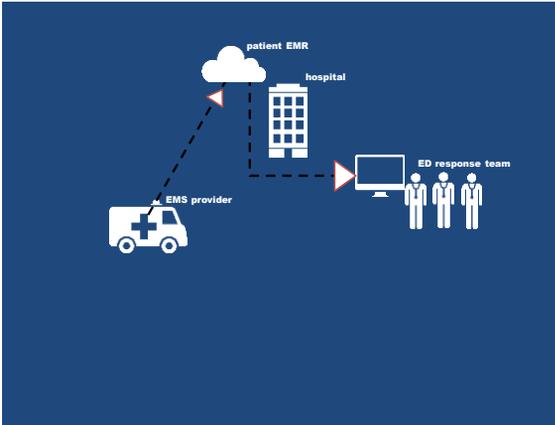
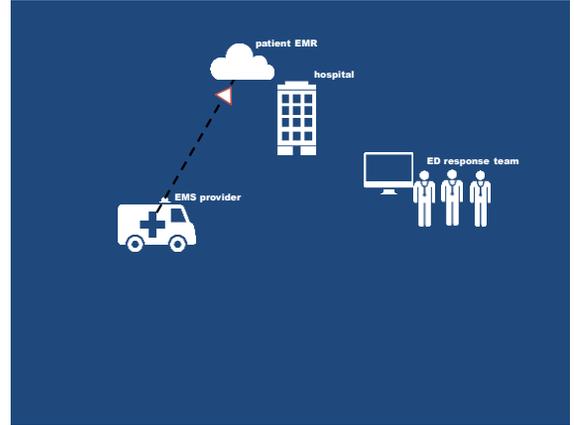
Stage	Percentage
Stage 0 - Paper chart based	46.3%
Stage 1 - Desktop access to PCR information entered after the call, multiple data sources	18.2%
Stage 2 - Beginning of a computerized data record (CDR), computers may be at point-of-care	38.4%
Stage 3 - ePCR entry, computers have replaced the paper chart for "real-time" data entry, clinical documentation and clinical decision support (pre-hospital protocols)	78.8%
Stage 4 - ePCR transmission to Hospital Dashboard, including EKG, available at the hospital, receiving unidirectional information from the field "real-time"	42.4%
Stage 5 - HIE capable, Advanced clinical decision support (on-line medical direction) through hospital Dashboard, proactive care management, and structured messaging	0%
Stage 6 - HIE capable, Transfer of data from the ePCR to hospital based EHR	0%
Stage 7 - HIE functional, bidirectional sharing of data between the ePCR and hospital based EHR, business and clinical intelligence	0%

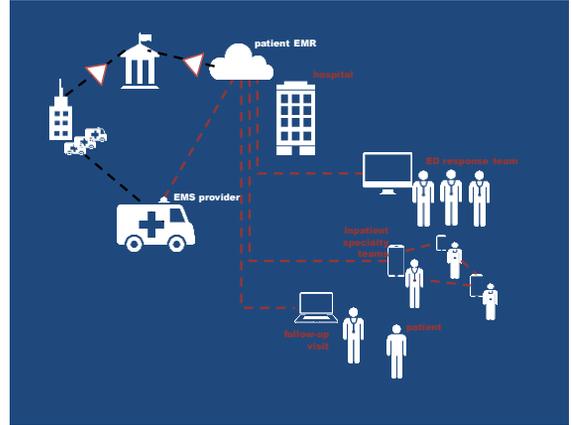
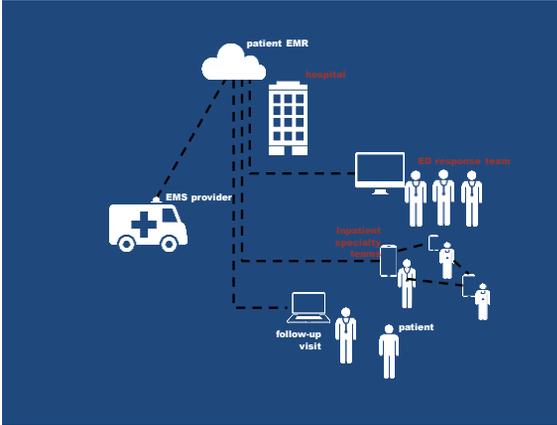
What is Health Information Exchange?



Statewide electronic PCR

Real-time exchange





WHY?

WHY?
 US DHHS — electronic movement of health-related information among organizations according to nationally recognized standards

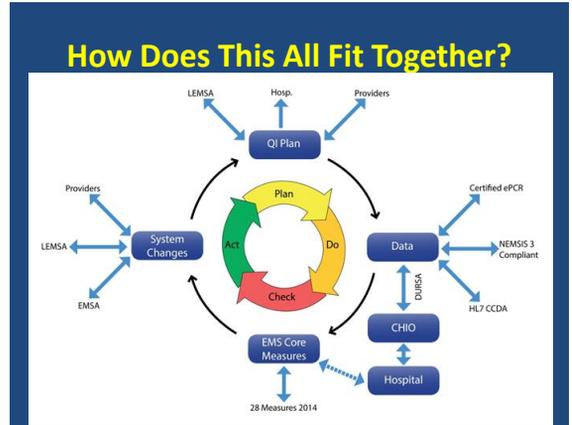
WHY?
 US DHHS — electronic movement of health-related information among organizations according to nationally recognized standards
Goal:

WHY?
 US DHHS — electronic movement of health-related information among organizations according to nationally recognized standards
Goal: facilitate access to and retrieval of clinical data to provide safer, timelier, efficient, effective, equitable, patient-centered care.

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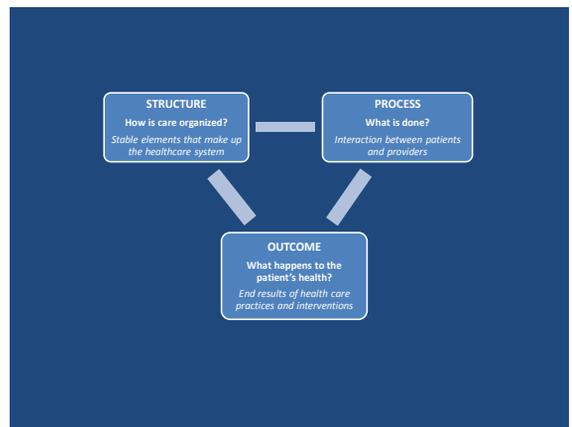
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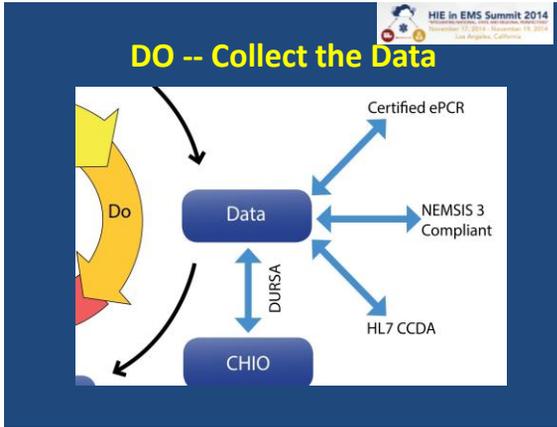
- **Course Objective 5: Using the PDCA Cycle as a model, describe how HIE fits into the entire scheme of Data Collection, Evaluation, and Quality Improvement**



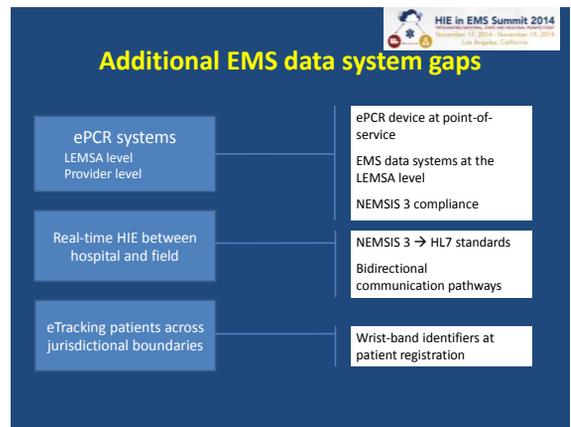
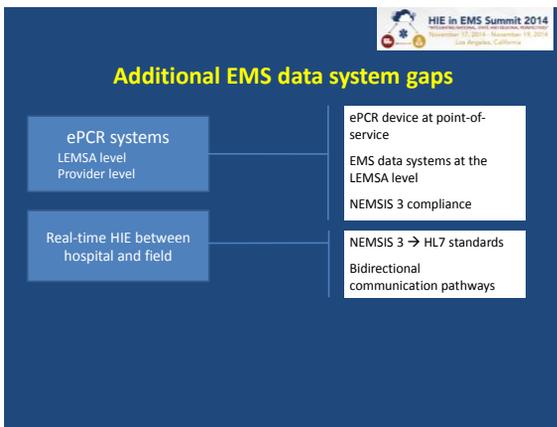
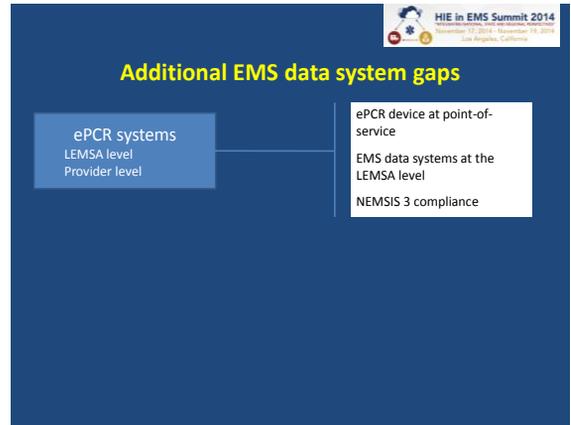
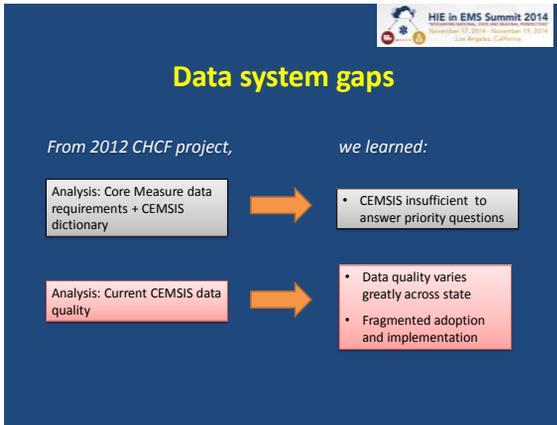
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- ## QI Indicators
- (A) Personnel
 - (B) Equipment and Supplies
 - (C) Documentation
 - (D) Clinical Care and Patient Outcome
 - (E) Skills Maintenance/Competency
 - (F) Transportation/Facilities
 - (G) Public Education and Prevention
 - (H) Risk Management

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- ## Quality Improvement Frameworks
- Donabedian's Quality of Care Framework
 - 1980s
 - Conceptualized three quality-of-care dimensions
 - **Structure** (Attributes of Setting)
 - **Process** (Good Medical Practices)
 - **Outcome** (Impact of Care)





- ### What is CEMSIS?
- California EMS Information System
 - 3 Parts
 1. Concept of having a Statewide Data System
 2. Data Dictionary – NEMSIS 3
 3. Software Platform that we use to collect/analyze data – Now ImageTrend at ICEMA



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ePCR



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- Course Objective 6: Identify the benefits of using NEMSIS 3x Standards to implement ePCR and HIE

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NEMSIS 3

- New Data Elements Definitions
- Not compatible with CEMSIS/NEMSIS 2.2.1
- Polling Completed for HealthLevel 7 (HL7) CDA for HIE Compatibility
- FHIR stands for Fast Healthcare Interoperable Resource.
 - FHIR combines the best features of HL7 V2, HL7 V3, and CDA, while leveraging the latest web service technologies.



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The Case for NEMSIS 3

NEMSIS is phasing out Version 2

January 1, 2017	NEMSIS will no longer accept Version 2.2.1 data
January 1, 2015	NEMSIS will begin accepting Version 3 data

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EMS Data Standards

- EMSA may write regulations
- Use NEMSIS 3.3.4 standards for data
- ePCR and data system must be NEMSIS 3 Compliant
- Transmission with HL7 format (CDA from NEMSIS)
- “Real-Time” information from field to hospital
- Hospitals to participate in connecting with CHIO for Health Information Exchange
- Through HIE linkages, EMS Providers can complete their ePCR with Hospital disposition data for QI purposes

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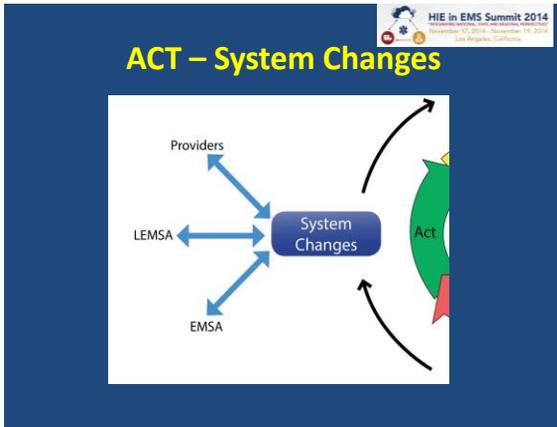
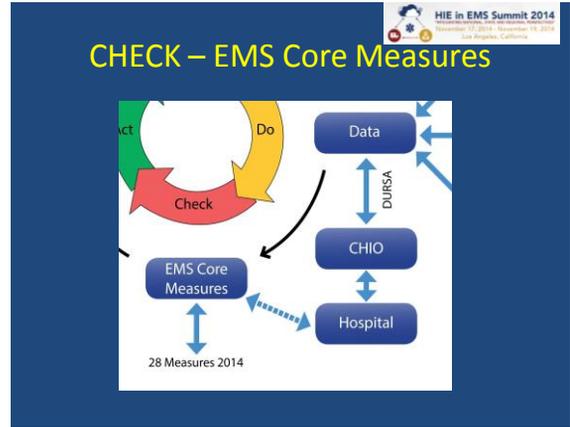
The Case for NEMSIS 3

Enhanced “Structure” Data

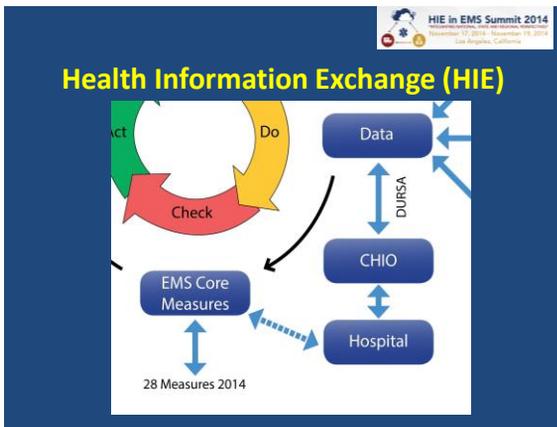
Structure	Hospitals	Providers	LEMSAs	Locations	Policies
Processes					
Injury/disease event					
911 first contact					
EMS dispatch					
Arrival on scene					
Patient care					
Transport					
Arrival at destination					
Inpatient care					
Sub-acute recovery					



OUTCOMES!



- ### National Trend towards Metrics and Core Measures
- Use of California Core Measures model is becoming widespread
 - HRSA Rural Health Flex Grant Performance Measures Panel
 - NASEMSP and NQF Core Measures Project for use in CMS Reimbursement
 - NASEMSO Begins Revision of NHTSA and NEMSIS Performance Measures Document
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- ### Health Information Exchange
- How is HIE related to EMS?
 - Health Information Exchange allows health care professionals and patients to appropriately access and securely share a patient’s vital medical information electronically.
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Three key forms of health information exchange

- **Directed Exchange** – ability to send and receive secure information electronically between care providers to support coordinated care
- **Query-based Exchange** – ability for providers to find and/or request information on a patient from other providers, often used for unplanned care
- **Consumer Mediated Exchange** – ability for patients to aggregate and control the use of their health information among providers

HIE and Meaningful Use

Meaningful use objectives are grouped into five patient-driven domains that relate to health outcomes policy priorities:

- Improve Quality, Safety, Efficiency
- Engage Patients & Families
- Improve Care Coordination
- Improve Public and Population Health
- Ensure Privacy and Security for Personal Health Information

Health Information Exchange is Happening Now



Health Information Exchange

- **Course Objective 7:**
- List which data elements EMS needs to send to the Hospital from the scene and enroute to the hospital
- List which data elements the Hospital wishes to receive

Health Information Exchange

- **Course Objective 8:**
- List which data elements EMS wishes to receive from the Hospital in the field
- List which data elements the Hospital would like sent during a prehospital patient encounter

Electronic Exchange of Patient Information—What's in the Middle??



Health Information Exchange

- Course Objective 9: Describe methods of how patient health information can be exchanged in an EMS setting?
- What is the role of a CHIO?
- Will there be a patient information repository, or warehouse, of information?
- Will there be a Query every time information is needed?

Electronic Exchange of Patient Information—What’s in the Middle??



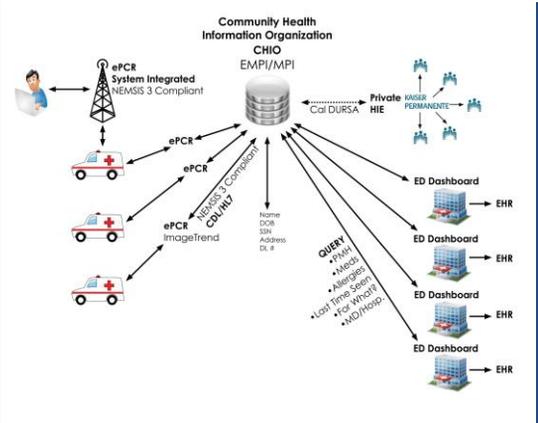
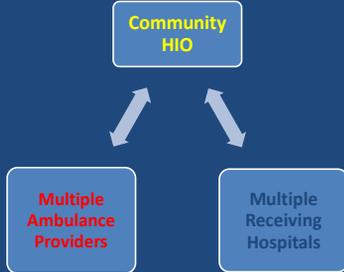
Vision of HIE and EMS

EMS Transport Providers and Receiving Hospitals, using Community Health Information Organizations (CHIO) as a hub, working together for “bidirectional” real-time health information exchange
Integrated with LEMSA Data Systems for Quality Improvement

The Role of Public, Community Health Information Organizations (CHIO)



Model for Use of Community HIO




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HIE Implementation Roadmap for EMS

- Report from ONC in April 2014
- Must consider Emergency Preparedness
- Goal 1
 - Implement Provider ePCR (NEMESIS 3 Compliant)
 - Coordinate with Community HIO
 - Transmission to Hospital Dashboard
 - Incorporation of electronic data into EHR at hospital
- Goal 2
 - Disaster Portal for patient EHR accessibility (PULSE)


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Goal 1 -- Developing EMS bidirectional data exchange with hospitals

- In this scenario, EMS personnel send data from their electronic patient care record (ePCR) to hospital EDs in “real-time”.
- The hospitals make limited patient data available to EMS personnel for a query while in the field.
- Information from the ePCR is assimilated into the hospital EHR.
- Finally, patient outcome information to support EMS quality improvement objectives is sent from the hospitals to EMS providers.
- The support of an CHIO that is responsible for mapping and routing the data among EMS providers and hospitals is the critical hub in this example.


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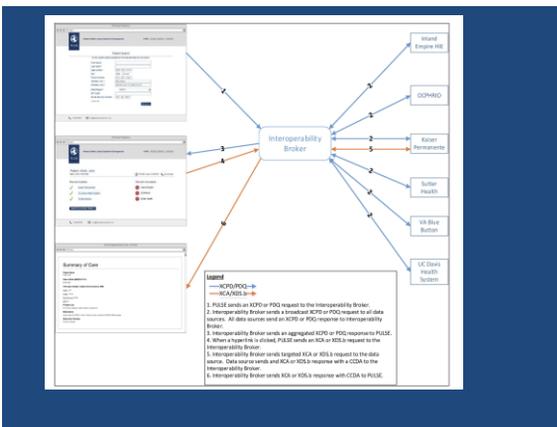
Working Assumptions for EMS and HIE

- EMS Providers must have ePCR systems that are NEMESIS 3 Compliant
- Utilize HL7 language with the NEMESIS CDA
- Hospitals must be willing to accept ePCR data into their EHR
- Work with Community Health Information Organizations (HIOs) as the information hub
- Match EMS providers and EMS receiving hospitals
- DURSA -- California Data Use and Reciprocal Support Agreement (CalDURSA)


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Goal 2 -- Creating a Disaster-response medical history portal:

- Using Integrating the Healthcare Enterprise (IHE) standards, we are interested in connecting health systems and HIOs to an interoperability broker that can be accessed via a web portal user interface.
- During a disaster (the definition of which is agreed upon by participants in advance), the web portal is activated.
- Healthcare professionals employed by health systems or participating with HIOs would be able to access patient records through their existing systems, and other allied healthcare professionals, such as emergency medical technicians and paramedics, would be able to access the portal through a URL.




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- Course Objective 11: Identify a method by which patients can keep their own information and share it with their healthcare provider when necessary during a disaster

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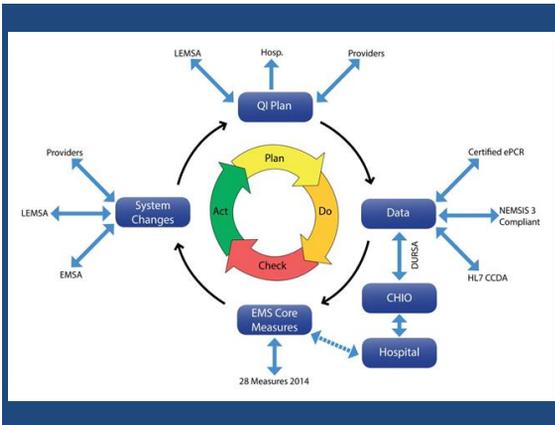
Consumer Mediated Exchange iBlueButton and ICEBlueButton

The diagram illustrates the iBlueButton and ICEBlueButton system. At the center is a 'Point of Care' hub. To the left, a 'Patient' smartphone app is shown with features: 'Real Time Automated Access & Download of Blue Button Records' and 'iBlueButton Patient App'. To the right, a 'Physician' tablet app is shown with features: 'Real Time & Single-Data Mining' and 'iBlueButton Professional Physician App'. The system is connected to various databases and services, including 'Real Time Automated Access & Download of Blue Button Records' and 'iBlueButton Professional Physician App'.

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Next Steps for Data and EMS?

- Regulations to standardize data using National standards ie NEMSIS 3
- ePCR by Providers
- Data submission by providers to LEMSAs and EMSA



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- **Course Objective 12:** Identify steps that can be taken locally to prepare to implement HIE for your EMS system

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Next Steps for HIE and EMS

- Fund Projects for Data, HIE, and Quality using limited PHHS Block Grant funds (\$400,000)
- Seek Funding from ONC
 - Connecting Community HIOs with emergency ambulance providers and receiving Hospitals (Regional Project)
 - Developing a Disaster Portal (PULSE)
- HIE and EMS Conference -- Nov 17-19, 2014 in Los Angeles

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Next Steps for HIE and EMS

- "One Patient, One Record"
- LEMSAs and Providers continue work on NEMSIS 3 adoption
- EMS Providers work to implement ePCR, using NEMSIS 3 data standards and tools
- EMS Providers collect and measure Core Measures at the Provider Level
- Begin Discussions with local CHIO and Hospitals to Implement HIE

Summary

- Benefits of HIE for EMS
- Quality Improvement
- ePCR
 - NEMSIS 3 Data, NEMSIS Compliant, HL7
- EMS Core Measures and Metrics
- Make System Improvements
- Implementing Health Information Exchange
 - Field to CHIO to Hospital (and Back)



Thank you!

For Further Information:

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