



Health Information Organization's Role in EMS Information Exchange

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 Cal EMSA HIE Summit
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Lecture Overview/Purpose

This lecture provides an overview of technologies and processes which can be used to exchange patient information during an EMS encounter, and how local HIOs, throughout California are preparing to assist with EMS data exchange.

The lecture will:

- Discuss touch-points between the EMS encounter, your local HIE, and the destination emergency department;
- Discuss standards for representation of information;
- Explore the national strategies for moving health data around;
- Present the California landscape of HIE.

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Learning Objectives

At the conclusion of this lecture, participants will be able to:

- Identify the standards for transmission and representation of data useful for emergency encounters;
- Understand the characteristics of each national strategy for exchange and describe the use of each;
- Recognize typical HIE services that might be used in an emergency situation;
- Discuss potential applications of HIE within your county.
- Understand the California data exchange strategy and options for connecting.

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Applicable Functions of an HIE

- Access to data on patients (query)
 - Central Repositories
 - Federation where data resides at the source
 - Hybrid – some data centrally, some at source
- Messaging
 - Communications between end-points
 - Moving data between end-points
- Resource Coordination
 - Real-time monitoring / Telemedicine
 - Triage and remote support / Trauma call-in

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Definition of an Emergency Encounter

- Notification
- Dispatch
- Arrive at Scene – Assessment
- Treatment at Scene
- Transport decision / Determine destination
- Load into transport / Connect to monitors
- Treatment during transport
- 5-minutes out
- Arrival and patient handoff
- Final documentation completion / handoff

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Intersect of Emergency Medical Services with HIE

	Access to data		Messaging		Resource Coordination	
	on patients	Communications	Moving data	Real-time monitoring	Triage / remote support	
Notification	A					
Dispatch		B	C			
Arrive at Scene – Assessment	D		E			
Treatment at Scene	F		G	H		
Transport decision / Determine destination		I	J	K	L	
Load into transport / Connect to monitors		M		N		
Treatment during transport	O			P	Q	
5-minutes out			R	S		
Arrival and patient handoff		T	U			
Final documentation completion / handoff			V			

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HIO Intersects

- A. Notification (access)
 - HIE access at the 911 PSAP Call Center – CAD connected to HIE
 - Id patient and retrieve recent patient encounters
- B. Dispatch (messaging)
 - Provide vital info such as home situation info
 - Determine the local HIO with core patient info
 - Establish communication w/ treating physician or PCP
- C. Dispatch (move data)
 - Provide POLST, DNR, other patient wishes
 - Pre-load ePCR demographics, med list, allergies

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Intersect of Emergency Medical Services with HIE

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HIO Intersects

- D. Arrive at Scene – Assessment (access)
 - Retrieve meds, allergies, prev encounter info
 - Retrieve CCD (clinical summary)
- E. Arrive ... (move data)
 - Consume CCD information into the ePCR
- F. Treatment at Scene (access)
 - Retrieve other pertinent patient info (CCDA)
- G. Treatment ... (move data)
 - Consume other pertinent info into ePCR
- H. Treatment ... (monitoring)
 - Open tele-monitoring session into HIO

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HIO Intersects

- I. Transport decision / Determine destination (messaging)
 - Notify specialists for Consult
 - Communicate with PCP Org or Hosp Triage Center
- J. Transport decision ... (move data)
 - Document decision to transport
 - Send initial info on patient to the receiving ED / Location
- K. Transport decision ... (monitor)
 - Continue monitor feeds into receiving ED / location
- L. Transport decision ... (consult)
 - Establish data feed to specialist (ePCR plus feeds)

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HIO Intersects

- M., N. Load into transport / Connect to add'l monitors
 - Communicate ePCR documentation to date and arrival estimate
 - Continue monitoring and data gathering (also continues any consult support)
- O., P., Q. Treatment during transport
 - Gather additional data on the patient
 - Continue monitoring
 - Continue support feeds to consults and ED triage desk
- R., S. 5-minutes out
 - Transmit Tx information to EHR for incoming patient
 - Continue monitoring

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Intersect of Emergency Medical Services with HIE

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HIO Intersects

- T., U. Arrival and Patient Handoff
 - Arrival data plus VS and reg info sent to ED
 - and consumed into the patient's ED EHR
- V. Final documentation completion / handoff
 - Final ePCR documentation transmitted to and consumed into the patient's ED EHR
- X. Final Patient Disposition in ED
 - Transmission of patient-specific disposition info to LEMSA
- Z. Monthly or other periodic statistics reporting
 - Transmission of ED and Trauma information to LEMSA / State

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National Strategy for HIE

- Adoption of electronic health records and capture of information electronically through of EHR incentive program
- Data aggregation on patients using HIE through state, regional, or enterprise HIE initiatives
- Promotion of national standards that allow interoperability across organizational (system) boundaries
- Person-to-person exchange through Direct messaging
- Organization-to-organization exchange through Exchange specifications
- Integrated health system that supports the triple aim

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Exchanges
MU and Data Capture

- | | |
|---|--|
| 1. Computerized provider order entry | 13. Patient educational resources |
| 2. e-Prescribing | 14. Medication reconciliation |
| 3. Record demographics | 15. Transmit care summaries for transitions of care |
| 4. Record vitals | 16. Report immunizations |
| 5. Record smoking status | 17. Secure messaging with patients ...plus menu items... |
| 6. Use clinical decision support | 18. Report syndromic data |
| 7. Patients view, download, and transmit health information | 19. Record electronic notes |
| 8. Clinical summaries to patients | 20. Imaging results |
| 9. Protect electronic health information | 21. Record family history |
| 10. Incorporate lab results | 22. Report cancer cases |
| 11. Generate patient lists | 23. Report other registry cases |
| 12. Reminders for follow-up care | |

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MU and Interoperability

- | | |
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Standards – HL7

- The ANSI-designated standards body for definition of message content for health information
- Two fundamental versions:
 - Version 2.x used for triggered transactions such as ADT, results, prescriptions, orders, and virtually all other transactions found in hospitals and ambulatory care
http://www.hl7.org/documentcenter/public_temp_C7FDD89D-1C23-BA17-0C2D990B02AEFC90/wg/conf/Msgadt.pdf
 - Version 3.x document model used in more recent models for data exchange
http://www.hl7.org/implement/standards/product_brief.cfm?product_id=7

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Standards – C-CDA

- Based on the RIM (Reference Information Model): a representation of all clinical domains and cornerstone of v3
 - Complete, explicit, normalized object model for healthcare data shared between all domains
- CCD – Continuity of Care Document
 - Joint effort of HL7 and ASTM to describe a summary useful to transitions of care
http://www.hl7.org/implement/standards/product_brief.cfm?product_id=6
- CCDA – Consolidated Clinical Document Architecture
http://www.hl7.org/implement/standards/product_brief.cfm?product_id=7

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Continuity of Care

- Contents include...
 - Advance directives
 - Allergy and drug sensitivity
 - Comments
 - Conditions
 - Encounters
 - Healthcare providers
 - Immunizations
 - Information source
 - Insurance provider
 - Language spoken
 - Medications
 - Person information
 - Plan of care
 - Pregnancy
 - Procedures
 - Results
 - Support
 - Vital signs

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Emerging Initiatives

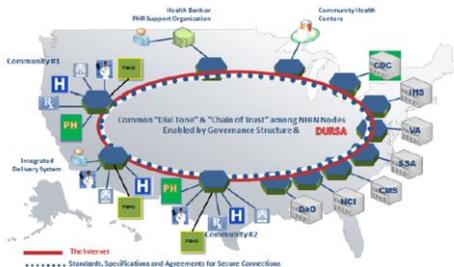
- **DS4P**: sequestering certain data elements perceived as being undesirable to share
- **Data Provenance**: describing the origin of health information
- **FHIR**: “latest” HL7 standard for accessing resources that represent granular clinical concepts
- **Data Access Framework**: a set of modular and flexible standards for querying for data across organizations

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“Network of Networks”

Nationwide Health Information Network (NHIN)



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Exchange Specifications

- SOAP-based web services that define:
 - How to establish security
 - How to assert authorization
 - How to find matching patients
 - How to locate and retrieve health information
 - How to push un-solicited information (with authorization)
 - How to subscribe to regular pushes of information
 - Also defines some use cases and content requirements
- <http://healthwayinc.org/index.php/resources/exchange-specifications>

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Direct Messaging

- SMTP- and S/MIME-based secure messaging that:
 - Provides point-to-point message delivery that "looks like email with attachments"
 - Includes a security model that ensures:
 - The sender is verified
 - Only the recipient can read the message or its attachments
 - The message arrived unaltered
 - Does not include explicit patient matching, authorization, etc.

<http://wiki.directproject.org/>

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NHIN and Beyond

- Nationwide Health Information Network as a network of networks
 - Concepts graduated to a multiparty agreement (the DURSA) and a set of SOAP-based exchange standards maintained by Healthway
 - Largely described as supporting query-based exchange
- Simpler mechanisms based on secure messaging
- Expansion to include public health, population health, and patient/consumer access
- Learning Health System as a larger collection of interoperable systems

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California Landscape



Options!

<http://checkpoint.org/>

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The California Association of Health Information Exchanges is a community of health information organizations and other California stakeholders working together to advance safe and secure health information exchange throughout California. CAHIE is creating an environment for promoting HIE and for sharing best practices, and a trust framework based on national standards for data access across organizational boundaries.

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Voluntary Collaboration

- CAHIE is a voluntary collaboration of enterprise and community-based Health Information Organizations (HIOs) in California
- CAHIE also includes as Members other stakeholders who are interested in promoting HIE in California
- CAHIE has 33 Members:
 - 12 are community-based HIOs
 - 10 are enterprise-based HIOs
 - 11 are government agencies, vendors, and other associations including both the CHA and CMA

<http://www.ca-hie.org/>

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CAHIE Activities

- 1) Community responses and participation in state and national activities, such as pilots, responses to calls for comment, etc.
 - POLST and PULSE are examples
- 2) Assistance to our emerging or expanding members
 - Such as exchange of sensitive information
- 3) Technical services (embodied in the CTEN) to enable inter-organizational exchange

<http://www.ca-hie.org/projects>
<http://www.ca-hie.org/resources>

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CTEN and the CalDURSA

- California Trusted Exchange Network (CTEN) provides a trusted environment for exchange in California
- CalDURSA – a single multiparty trust agreement that enables CTEN participants to interoperate with each other
 - Direct messaging
 - Exchange’s query-based mechanism } (i.e., national standards)
 - Directory services
 - Other approved transaction patterns (e.g., PULSE)
 - Single administration point for all Trust Bundles used to enable approved transaction patterns
 - California Interoperability Committee established to create and administer CTEN and its “rules of the road”

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Why should you be interested?

1. Forum for uniform interoperability in California
2. Focal point development and dissemination of best practices that promote interoperability and HIO/service sustainability
3. Focal point for cooperative development of state-wide services
 - Focused on providing a light-weight, highly agile environment for moving data between organizations
 - Represents California constituents in national-level HIE conversations, standards development, and pilot programs
 - Promotes investment in HIE in California

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Why should you be interested?

- CTEN provides a single point of access to interoperability in California
- Single multiparty agreement that governs rules of the road
- Light-weight services that provide access
- Rigorous but agile process to add new services, address new use cases, and solve new problems

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Current Status

- Completed the CalDURSA
 - Ten HIOs have signed so far
<http://www.ca-hie.org/projects/caldurso/signatories>
- Launched CTEN services
 - Six of the HIOs are already enabled to exchange information
<http://www.ca-hie.org/projects/cten/participants>
- Convened the CIC
 - Ready to vet and on-board new participants to the CTEN
 - Ready to consider new services, new use cases
<http://www.ca-hie.org/projects/cten/cic>
<http://www.ca-hie.org/projects/cten/onboarding>

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Where to Start?

- Get in touch with your local community HIO
 - Determine what their capabilities are to support your desired level of interoperability
- Find out more about the CalDURSA, CTEN, and membership in CAHIE
 - Help us add services that support emergency services
- Participate in PULSE

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Thank you...

...on behalf of our 33 Members for your interest in CAHIE.

Ask questions of any member of the Executive Committee:

- David Minch, President and Board Chair
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- Bill Beighe, Vice Chair
bbeighe@pmgsc.com
- Chris Jaeger, MD, Secretary
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Questions???

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