



NCEMS HIE GRANT PROGRESS REPORT FOR NORTH COAST EMERGENCY MEDICAL SERVICES

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The documentation below outlines the key objectives assigned to TempDev, desired outcomes, progress indicator and a brief status statement.

Objective 4: Meeting the technological requirements for EMS to hospital information exchange: The management database described in Objectives 2 and 3 will draw on data provided through ImageTrend/ICEMA. With technical assistance from ImageTrend, ICEMA has formulated a plan to build a bi-directional interface able to share data through the Inland Empire Health Information Exchange. In turn the Inland Empire Health Information Exchange will draw on the datasets available to other regional HIE's, and thus permit ICEMA to serve as the gateway to hospital data linkages throughout the state. While this is currently the preferred model for North Coast EMS to share data with other regional medical datasets, such as those available to the Northern California Health Information Network and Redwood MedNet, the availability and adequacy of these linkages must first be confirmed. Should the linkages or available datasets be found lacking, alternative means of electronically accessing data elements of high value to EMS will need to be determined.

4.1

Objective	Assess projected and possible data linkage (i.e. bi-directional interface) between ICEMA and HIE's in California.
Desired Outcome	A description of, and approximate timeline for, the establishment of ImageTrend/ICEMA data linkages with one or more HIE's in California.
Progress	%100
Summary of Findings	ICEMA recently engaged in a small pilot project to test data exchange between ICEMA and ImageTrend. However, there are no known projected data linkages (i.e. bi-directional interface) between ICEMA and other HIE's in California

4.2

Objective	Identify shared linkages between HIE's serving the NCEMS region and the Inland Empire HIE, i.e. the HIE serving the ICEMA region.
Desired Outcome	A description of the current and projected linkages between HIE's serving the NCEMS region and the Inland Empire HIE.
Progress	100%
Summary of Findings	Although there are no direct current or projected HIE to HIE linkages, there are other overlaps and opportunities for data sharing for groups using a direct messaging solution.

4.3

Objective	Assess whether identified linkages meet the interoperability goals set forth in the HITECH Act and/or promoted by ONC.
Desired Outcome	A determination as to which possible HIE linkages meet the interoperability goals set forth in the HITECH Act and/or promoted by ONC.
Progress	100%
Summary of Findings	Review shows HITECH goals as broad reaching. Although there are not current linkages, future linkages can take many forms to meet interoperability goals. The primary goal: Goal I: Achieve Adoption and Information Exchange through Meaningful Use of Health IT -does set standards for Hospital's and eligible providers for data exchange formats and content.

Objective 5: Dataset analysis: Work with our local HIE's to review the datasets available to them and to North Coast EMS to identify opportunities for patient discovery and for sharing data of value to EMS, to hospitals or to other local health providers. Catalog and prioritize those data elements of most potential value and determine whether other data elements currently unavailable might be collected in the future.

5.1

Objective	Determine the datasets currently being collected by NCEMS region hospitals and other health care providers.
Desired Outcome	A listing and description of the datasets currently being collected by NCEMS region hospitals and other health care providers.
Progress	100%
Summary of Findings	Lists and notes containing data elements are in the document titled: HIE Discovery. NEMSIS v2 and NEMSIS v3 data sets were reviewed along with the C-CDA data set objectives for Hospital and Provider CCD and/or ADT(Continuing Care Document and (Admit, Discharge, Transfer) which can be transmitted within C-CDA objectives set forth as part of HITECH's Meaningful Use State 2 criteria.

5.2

Objective	Inform NCEMS region hospitals and health care providers about the dataset available to NCEMS.
Desired Outcome	A list of region hospital and health care provider representatives with whom the Project Director has established contact, informed of the dataset generated by NCEMS, and of our agency's desire to collaborate in a possible exchange of patient EHRs.
Progress	95%

Summary of Findings	Contact and discussions at local HIE, EMS and Hospitals made. Lists and notes containing names and organizations where contact has been established is in the document titled: HIE Discovery. We still need to identify the contact information for the key IT decision makers for some of our local hospitals. Although we have many local contacts, all of whom have expressed interest in HIE with EMS, many of these smaller hospitals are managed by a parent organization, who allocate resources and project priorities at a national level. Additional barriers regarding providing dataset description to other providers includes an undefined set of working full HIE criteria. We were able to reach out to Nicole Lamm, Sutter Lakeside Emergency Department nurse manager, and are still working on a primary contact for Clearlake.
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5.3

Objective	Determine which datasets generated by local hospitals and other healthcare providers are available to HIE's serving the NCEMS region.
Desired Outcome	A listing and description of the datasets generated by local hospitals and other healthcare providers that are available to HIE's serving the NCEMS region.
Progress	100%
Summary of Findings	Dataset analysis showed a wide variance between EHR (local hospital and provider) data collection and ePCR records. Areas of common care data points included past medical history, allergies and medications. One dataset of interest to the EMS community is the ADT document (Admit, Discharge, Transfer) Lists and notes containing data elements are in the document titled: HIE Discovery.

5.4

Objective	Based on the results of activities 5.1-5.3 above, analyze the potential for exchanging EMS data with hospitals and other healthcare providers within the NCEMS region.
Desired Outcome	An analysis of the potential for NCEMS to exchange EMS data with hospitals and other healthcare providers within the NCEMS region.
Progress	90%
Summary of Findings	There is not currently a confirmed best practice model in place to draw upon. San Diego Health Connect currently has the highest data exchange success rates. The precise data exchange format is unknown at this time and varies between the 5 ePCR vendors that they partner with. However potential outcomes and designs have been identified and recommendations include utilizing the C-CDA format for data exchange as the current healthcare field standard.

5.5

Objective	Determine which, if any, data elements or datasets currently unavailable in the
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	NCEMS region might be desirable in the future.
Desired Outcome	A listing and description of the data elements or datasets that are currently unavailable to NCEMS, but which might be worth soliciting in the future.
Progress	%100
Summary of Findings	The collection of actual data elements is not currently perceived as the primary barrier. Transmission routes, variance of data collection format between NEMESIS and EHR and obtaining the data in a live, real time request model has been the primary barrier identified by this discovery project.

Objective 6: Authorization Framework Review: Determine the regulatory and security requirements that must be met in order to share collected patient PHI through the HIE or through direct data linkages with local hospitals.

6.1

Objective	Determine the legal framework under which NCEMS may participate in the electronic exchange of protected patient data with regional HIE's, hospitals or other healthcare entities. i.e. governing state and local regulations.
Desired Outcome	A description of the legal framework under which NCEMS may participate in the electronic exchange of protected patient data with regional HIE's, hospitals or other healthcare entities. i.e. governing state and local regulations.
Progress	%100
Summary of Findings	<p>The upcoming approved Assembly Bill No. 503 for California Section 1797.122 Health and Safety Code regulation supports the legal framework for data access by LEMSA organizations to support continuity of patient care and data collection. Existing HIPPA regulation outlines guidance for protected patient data exchange. Additional details regarding HIPPA regulations are in the document called: HIE Discovery.</p> <p>Other state EMS bill activity regarding EHR:</p> <ul style="list-style-type: none"> • Assembly Bill No. 1621 <ul style="list-style-type: none"> – Required the California State EMS Authority to utilize its California Emergency Medical Services Information System (CEMSIS) and adopt a single statewide standard for the collection of information – Last activity 11/30/2014- placed in appropriations suspense file. • Assembly Bill No. 1129 section 1797.227 <ul style="list-style-type: none"> – Signed by the governor on 9/30/2015, requires emergency medical care providers to use an electronic health record (EHR) system that exports data compliant with current CEMESIS and NEMESIS standards. – Does NOT mandate the use of a specific EHR system.

6.2

Objective	Determine the NHIN Foundation technical specifications governing NCEMS's exchange of protected patient data with regional HIE's, hospitals or other healthcare entities.
Desired Outcome	A description of the NHIN Foundation technical specifications governing NCEMS's exchange of protected patient data with regional HIE's, hospitals or other healthcare entities.
Progress	%100
Summary of Findings	Both Assembly Bill No. 503 and HIPPA regulations support the exchange of protected patient data with regional HIE's, hospitals or other healthcare entities for the purpose of continuing patient care and data collection to improve patient outcomes. It is recommended that NCEMS engage in contracts modeled after Business Associate type agreements -with exchange partners regardless of their covered entity status. These agreements, plus vendor software agreements cover expectations regarding PHI data management. System user log in and VPN (virtual private network) requirements cover technical aspects as set by the business entity.

6.3

Objective	Evaluate the potential need for, or benefit of, (e.g. HIE or hospital data release) IRB (Internal Review Board) approval of NCEMS exchange of protected patient data with regional HIE's, hospitals or other healthcare entities.
Desired Outcome	A description of the potential costs and benefits of seeking IRB approval of North Coast EMS electronic data exchange with HIE's, hospitals and/or other healthcare entities.
Progress	%100
Summary of Findings	IRB criteria was collected, documented and reviewed. A recommendation to only utilize de-identified data in reporting and findings negates the need to have a formal IRB review process. Links to IRB decision making charts are included in the document titles: HIE Discovery.

6.4

Objective	Identify contacts within academic institutions for the possible establishment of an IRB process for NCEMS's exchange of protected patient data with HIE's, hospitals or other healthcare entities.
Desired Outcome	A listing of contacts within academic institutions who have expressed willingness to, or interest in, engaging with NCEMS in an IRB process for NCEMS's exchange of protected patient data with HIE's, hospitals or other healthcare entities.
Progress	N/A
Summary of Findings	At this time, outcomes and findings data can be aggregated and de-identified

Findings	for quality improvement review, negating the need for an IRB.
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6.5

Objective	Make specific management database authorization framework recommendations base on the outcomes of Objectives 3, 4 and 5.
Desired Outcome	A recommendation on the steps to be performed in order to ensure NCEMS compliance with state and federal regulatory requirements, and with specific electronic data exchange partner institutional (e.g. hospital) requirements, prior to the electronic exchange of protected patient information.
Progress	%100
Summary of Findings	It is recommended that NCEMS either pursue a direct point to point HIE secure HL7 messaging standard using the C-CDA format, including PDF exchange for non discrete data points or engage in secure DIRECT messaging with information trading partners, ensuring that a business associate agreement, or direct trust certificate is obtained prior to data transmission.

Objective 7: Cost Analysis: Determine the cost of establishing and maintaining data linkages.

7.1

Objective	Describe the costs normally associated with establishing and maintaining data linkages with database vendors, HIE's, hospitals and other healthcare providers.
Desired Outcome	A historical review of payment structure options adopted by entities such as HIE's, hospitals, other healthcare providers, educational institutions, and governmental institutions, when generating revenue from, or financing the exchange of, electronic patient data.
Progress	90%
Summary of Findings	A sample budget for implementation and ongoing support costs has been created. Due to unknown specific interface requirements, the budget is an estimate based on currently known variables. Best practice would be to build a detailed technical roadmap utilizing interface architects, and send that roadmap to vendors for bidding.

7.2

Objective	Based on the outcomes of Objectives 3, 4, 5, and 6, identify the likely costs associated with the most promising of each patient data exchange option, to include the additional hardware and infrastructure costs required to maintain interoperability.
Desired Outcome	A list of data exchange options and likely associated costs.
Progress	90%
Summary of	All known costs have been estimated. Without a clear hospital commitment,

Findings	costs for the hospital participation and any hardware/ infrastructure needs are still unknown. The local hospital that can directly determine their participation priorities is in an area with a minimally functioning local HIE. The two target hospitals with a strong HIE partner are owned and administered by out of the area parent companies. It is recommended the any future budget have contingency funds allocated for these unknowns.
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7.3

Objective	Evaluate the data exchange options identified in Activity 7.2
Desired Outcome	A ranked list of the most promising data exchange options for North Coast EMS.
Progress	100%
Summary of Findings	<p>Recommendation options (ranked by perceived likelihood of successful outcome):</p> <ol style="list-style-type: none"> 1) Utilize the current HL7 data structure C-CDA standards to set up a scalable solution for data exchange between ImageTrend, Redwood MedNet and Sutter Lakeside Hospital. Leverage the lessons learned by San Diego Health Connect as a base project to establish exchange protocols and partner engagement, exchanging some discrete data as possible, allowing non matching data points to be sent via PDF. 2) Utilize Direct messaging protocols to send ePCR and receive discharge data as PDF documents, allowing a demographic data match. CDD documents in an XML formats can be exchanged as well. 3) Engage in one full point to point pilot with HL7 C-CDA exchange between hospital and ePCR, only exchanging data that can be consumed from discrete data fields.

Objective 8: Charting the course to real-time EMS HIE: As an end result of this grant, North Coast EMS will be able to articulate a clear vision about how to achieve EMSA’s ultimate goal of providing real-time patient PHI to EMS responders in the field. This vision will include the cost and benefits of the many technological, administrative, operational, and partnership options available, and include a concrete recommendation about the best course our agency and our region should pursue. North Coast EMS will develop an approximately one-hour presentation describing this vision in a format suitable for an EMS audience with no or little previous exposure to HIE, and be prepared to offer this presentation to our local EMS stakeholders and at least one EMSA sponsored event.

8.1

Objective	Identify past or ongoing initiatives to provide real-time electronic PHI to EMS responders in the field.
Desired Outcome	A description of past or ongoing initiatives to provide real-time electronic PHI to EMS responders in the field.

Progress	%100
Summary of Findings	There are two key ImageTrend HIE projects in California. One current live project with San Diego Health connect where a federated data model is used to exchange a PDF ePCR and hospital discharge report/face sheet. The second was a recent pilot with ImageTrend and ICEMA to exchange patient demographic data.

8.2

Objective	Describe the real-time electronic PHI provided to EMS responders in the field and the objective sought through the provision of that data.
Desired Outcome	A description of the real-time electronic PHI provided to EMS responders in the field and the objective sought through the provision of that data.
Progress	%100
Summary of Findings	San Diego Health Connect provides a real time data exchange with EMS providers and participating hospitals. The electronic exchange uses HL7 messaging to deliver non discrete data in a PDF format.

8.3

Objective	Given the outcomes of Objectives 3, 4, 5, 6 and 7, describe the likely technological and regulatory challenges - as well as the likely associated costs – involved in providing the types of electronic PHI described in Activity 8.2.
Desired Outcome	A description of the likely technological and regulatory challenges - as well as the likely associated costs – involved in providing the types of electronic PHI described in Activity 8.2.
Progress	%100
Summary of Findings	Analysis of regulatory challenges has deemed that regulations are not the primary nor a significant barrier. Implementation costs, limits of local HIE coverage service areas and data set type mismatch have been identified as the primary barriers to exchange.

8.4

Objective	Given the outcome of Activity 8.2 and 8.3 determine the most promising and practical real-time electronic PHI that might be provided to NCEMS EMS responders in the field.
Desired Outcome	A description of the most promising and practical real-time electronic PHI that might be provided to NCEMS EMS responders in the field.
Progress	%100
Summary of Findings	Our findings indicate that the most promising and practical outcome would be to emulate the current structure utilized by San Diego Health Connect as a base project. This would also include establishing exchange protocols and partner engagement, providing a federated model of patient index for search and match, exchanging some discrete data as possible, allowing non matching data

	points to be sent via PDF. However a higher reaching goal would be to ensure that C-CDA architecture is utilized to allow for future scalability.
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8.5

Objective	Identify the most promising options for providing real-time electronic patient PHI to NCEMS responders in the field with the likely associated cost and approximate time required to implementation.
Desired Outcome	A description of the most promising options for providing real-time electronic patient PHI to NCEMS responders in the field with the likely associated cost and approximate time required to implementation.
Progress	%100
Summary of Findings	In addition to findings outlined in objective 8.4, our experience is that a newly written interface can take between 6 months to a year to complete. Understanding the HIE interfaces are new to the EMS community, a timeline of 18 months, to include key stakeholder engagement and detailed interface requirements has been outlined in the accompanying HIE Discovery document. A sample budget to obtain those objectives has been outlined at a high level.

8.6

Objective	Based on the outcome of Activity 8.5, establish a plan for providing real-time electronic patient PHI to NCEMS responders in the field.
Desired Outcome	A plan for providing real-time electronic patient PHI to NCEMS responders in the field.
Progress	%100
Summary of Findings	A sample project budget, timeline and objectives have been outlined. Initial discovery shows that a one to one point HIE exchange would take about 18 months to implement with an estimated cost of \$250,000.

8.7

Objective	Develop a one-hour presentation describing the HIE discovery project findings.
Desired Outcome	A one-hour presentation suitable for an EMS audience with little or no prior exposure to HIE.
Progress	%100
Summary of Findings	A slide deck describing project, objectives, service areas, findings, challenges and a proposed timeline has been developed.