Contra Costa County Data Infrastructure Project

Out of Chaos... Organization?

Patricia Frost RN, MS
Director Contra Costa Emergency Medical Services
EMS System Data Environment

- 86,134 EMS Responses
- 64,527 Transports
- 25 EMS Data System Sources
  - 9 Emergency Receiving Hospitals
  - 9 Fire Districts
  - 3 Fire-EMS Dispatch
  - 3 Emergency Ambulance Providers
  - 1 Base Hospital
- National, State and Local Platforms
- Clinical/QI (Core Metrics)
- Trauma System (Local and Region)
- STEMI System (Local)
- Stroke System (Local and State)
- EMS Disaster Communications
  - ReddiNet and Radio Testing
EMS System Redesign In Progress
Contra Costa Health Services
IHI and Lean Six Sigma Culture
Systems are Perfectly Designed to Produce Success and Failure

Intelligent Design-Coordination (Processes)-Protocols (Standard Work)
Our Goal: Create Reliable Data Cycles Supporting Improvement and a Safety Culture
Contra Costa EMS Experience
Patient Care Data and HIE

- MEDS (AMR)
  - 2004
- First Watch
  - 2006
- Zoll (Fire)
  - 2007
- HL7-Ready Platforms
  - January 2014
- CARES
- Trauma One
- California Stroke Registry
- LifeNet & CodeSTAT
The Problem
Staff working for the Data Systems
With Lots of Heavy Lifting
Drowning in Data...Starving for Information
Fragile Data Systems
Single (People) Points of Failure
Objective: Develop the Reliable Data Infrastructure to Focus on the “What Matters”
Began with the Simple Questions...
What Do We Currently Do?

And Is There An Easier Way?
CCEMS Project Deliverables

- Workflow assessment and recommendation
- Pilot dashboard development supporting EMS System data integration
- Explore CCHS EPIC Health Information Exchange Opportunities
Pre-hospital Data Integration Assessment and Implementation Support

- **Data Silos:** 13 individual information systems

- **Staff Intensive Data Workflows:** Report Access and Automation Gaps

- **Internal and External Costs:** Supporting Data Management

- **Unique Opportunity:** By 2016 hospitals countywide on EPIC.
# Information Processing Workflow

<table>
<thead>
<tr>
<th>Program</th>
<th>Current Flow</th>
<th>Current Staff</th>
<th>Opportunity</th>
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<tbody>
<tr>
<td>Trauma</td>
<td>20 steps</td>
<td>2-3 EMS staff, 1 hospital, 20+ MICN/ED staff &amp; field personnel</td>
<td>9 steps</td>
</tr>
<tr>
<td>Stroke</td>
<td>22 steps</td>
<td>2-3 EMS staff, 7 hospital staff, field personnel</td>
<td>7 steps</td>
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<tr>
<td>STEMI</td>
<td>13 steps</td>
<td>2-3 EMS staff, 6 hospitals, ED staff, field personnel</td>
<td>4 steps</td>
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<td>CARES</td>
<td>28 steps</td>
<td>4-5 EMS staff, 9 hospitals, ED staff, field personnel</td>
<td>16 steps</td>
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</table>
Findings: Unsustainable Workflows
Findings: Unsustainable Costs
Data Management & Oversight by Program
Annual Expenditure: $984,238

- Cardiac Arrest, $156,001, 20%
- QI/Safety, $194,893, 25%
- IT/Data Systems, $144,587, 17%
- IT/Data HIE, $99,836, 12%
- Contract Compliance, $79,702, 10%
- STROKE, $60,390, 8%
- STEMI, $69,080, 9%
- Dispatch, $34,945, 4%
- Fire ePCR, $9,806, 1%

Findings: Unsustainable Costs
Data Management & Oversight by Program
Annual Expenditure: $984,238
So What Have We Learned So Far?
Planning for Efficient Data Flow Is a Challenging but Solvable Problem
Right Tools for the Job Needed
Many Levels for EMS Health Care Information Exchange...In Motion

Prehospital EMS-Health Information Exchange

- Prehospital EMR
- Web Services
- SOAP
- Evidenced Based EMS Care
- Situation Awareness and Management
- HL7 CCD
- Real Time Decision Support
- MOBILE/DEVICE
EMS as a Valued Partner
Delivery of Population Based Health Care
Matching Patient Need to Health Care Resource Mobile Mental Health Services
Understanding Workflows Essential
EMS System-Wide HIE
STEMI 12 lead transmission

• What We Did (Consensus)
  ▫ Entire STEMI System Wired
  ▫ 6 STEMI Centers
  ▫ Single Spec for 12 lead monitors
  ▫ All ALS First Responders
  ▫ All ALS Transport Providers

• What It Took ($$$$$$)
  ▫ AFG Regional Grant for over 2 million
  ▫ 850K of matching EMS funding
  ▫ National Vendor Savings 350K
  ▫ Each STEMI Center buying own transmission platform (LifeNet: 10K per year)

$ 5,000 per false activation
False Activation Rate 26-41%
Potential STEMI Center Savings $25,000 - $80,000/year/hospital
Total (6 SRC): $150,000 – $480,000/ Annual system savings
Contra Costa County High-level Dataflow

Transmitting to Hospitals, Zoll ePCR, and Contra Costa County

San Ramon Valley (Modems)

Moraga Orinda FD (Titans and Modems)

Contra Costa County Fire (Modems)

El Cerrito FD (Modems)

Transmitting to Hospitals and Contra Costa County

AMR Contra Costa County (Modems)

Transmitting to Hospitals and Zoll ePCR

Pincola FD (Modems)

Transmitting to Hospitals

Rodeo Hercules FD (Modems)

Contra Costa County – CODESTAT

Receiving Cardiac Cases From:
AMR Contra Costa County, Contra Costa County Fire, San Ramon Valley, Moraga Orinda FD, El Cerrito FD

Receiving 12-leads transmitted to hospitals From:
San Ramon Valley, Moraga Orinda FD, El Cerrito FD, Contra Costa County Fire, AMR Contra Costa Fire

Via CODE-STAT, PCO file is exported and attached in Zoll ePCR
* No Vital Signs or Report Data received using this process
Our First Success with HIE Push

Next Steps Facilitate SRC Trust in HIE Technology
Dashboards, Reporting and Alerts

- Situation Awareness
- Process Improvement
- Engaged Workflows
- Transparency
- Real Time
- Automated Reporting
- Data Management Efficiencies
- Performance Based
- System Flow Management
- Interval Status Reports
# First Watch Hospital Offload Dashboard

## Real Time Situation Status

### Contra Costa County Hospital Status Dashboard

**10/25/2013 4:08:02 PM**

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<th>Location</th>
<th>Enroute</th>
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<th>Elapsed - Max</th>
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Improvement Focused Discussions

Timely Offload Essential to Support System Response and Capability
Capturing Hospital Internal Process Improvement
Offload time reduced from 17 to 13 minutes
Now 11-12 minutes
EMS-ED Patient Handoff Workflow

Transport After Patient Handoff Workflow
Estimated average ePCR completion time 15 minutes
$160/unit hour = $40/call
55K Transports/year =$2,200,000
EPIC-EMS/ED Interface Exploration
Patient Disposition Access

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Forging Ahead...
Data Pathways for Valued-Based Health Outcomes
ARE WE THERE YET?

No.
SUCCESS
Because you too can own this face of pure accomplishment
Contact Information
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