Integration of Crash, EMS and Trauma Data: Contrasting Current Applications and Future Directions

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2013 DOT/TRCC Traffic Records Forum
What we will cover

• Where are we…NEMSIS Data
• Crash-EMS-Trauma Blue Print
• Traditional Linkage Approach (NC)
• Low Cost, Unique Approach (KS)
• Making the connections (AZ)
• What will the future bring?
State and Territory Map

Status of States and Territories as of November 1, 2013

45.5 million Records

2011 = 14.6 million
2012 = 19.8 million
2013 = 10.9 million
- with Quarters 3 & 4 of 2013 yet to be submitted
The portability of data - the NEMSis standard.
Benefit of a Common XML

NTDS

External Server

"Validator"

NEMSIS

"Validator"

Outcomes
In North Carolina, South Carolina and West Virginia, the EMSPIC maintains and supports state EMS data system applications, provides 24/7 technical support, and analysis for process improvement.

CCHI

A Practice-based, multidisciplinary research unit with a variety of informatics-related projects such as...

NC DETECT
(North Carolina Disease Event Tracking and Epidemiologic Collection Tool)
A Statewide, Web-based, public health surveillance system utilizing 24/7 acute case hospital-affiliated emergency departments (EDs) in NC.
NC Linkage Partners

- X = Not Finished
NC Linkage Partners (Cont.)

- Linkage Variables by Source
  - 24 hour ED Linkage:
    - (DOB, Sex, Destination hospital, DestinationDateTime)
    - Daily Exchange Available
  - Trauma Registry:
    - (PatName, DOB, Sex, Destination Hospital, DestinationDateTime)
    - Daily Exchange Available
  - Crash:
    - (DOB, Sex, County, Destination Hospital)
    - Yearly Exchange Available
NC Linkage Partners (Cont.)

• Linkage Variables by Source
  – Stroke Registry:
    • (PatName, DOB, Sex, Destination Hospital, DestinationDateTime)
  • **Daily** Exchange Available
  – Hospital Discharge:
    • (DOB, Sex, Destination Hospital, DestinationDateTime)
  • **On-Demand** Exchange Available
  – PCR2PCR (⬅ Most Requested Enhancement!): identifies multiple EMS connections when they occur. Critical for Trauma registry to know what happened on the initial call, not just the final transport to the trauma hospital.
    • **Daily** Exchange Available
Integrating EMS Data Collection with the Trauma Registry and Fars access

• Joe Moreland
  – Kansas Board of EMS
  – EMS Data Manager
  – October 27, 2013
Solution

• ImageTrend and Digital Innovations (DI)
• DI Continuum of Care Server (CCS)
• CCS Software hosted at DI
  - Patient matching & data exchange will be done at the hospital
    – Hospital has relevant identifiers for patient match
• CCS checks to see if the EPCR is seeking is available
• CCS will use DI live server
KEMSIS and KDHE Data Integration

**Web Application Server(s)**
- **Existing Functions**
  - Local Hospital Trauma Submission Upload
  - Online Web Trauma data entry
- **New Functions**
  - Integration with KEMSIS to allow for remote queries of EMI data by Trauma hospitals
  - Support for EMS Agencies to remotely query Trauma Outcomes while online to KEMSIS

**Database Server**
- KS State Trauma Data

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**Web Application Server**
- **Existing Functions**
  - NEMSIS XML File Importing
  - Online Data Entry
  - Reporting and Viewing of all State EMS Data
  - Hospital View of EMS Data
- **New Functions**
  - Integration with KDHE to allow for remote querying of EMI data for Trauma hospitals
  - EMS Agencies able to view Outcomes from Trauma data while online on KEMSIS

**Database Server**
- NEMSIS Data
summary

• Trauma registrar logs into CCS and enters date patient arrived at hospital
• CCS sends web service call to ImageTrend and checks for all patients arriving the receiving hospitals 72 hours prior to and after the date entered
• Trauma registrar is presented a list of patients and selects the desired patient. 33 data elements are copied from KEMSIS and imported into trauma registry
• 2 Hospital elements returned to EMS
  – ED disposition, E22_01
  – Hospital disposition, E22_02
• $10,000 to ImageTrend plus the $30,000 for the hospital bridge
• $44,000 to Digital Innovations
FARS

• Fatal Analysis Reporting System
• NHTSA requirement for all states to submit data for traffic crashes that have fatalities
• FYI, the FARS manual for 2010 is 706 pages in length
• Too many fields for me to count. They do not use continuous numbering and I could not find it in a spreadsheet.
EMS Elements

- C28 – Time EMS notified
- C29 – Time EMS arrived at scene
- C30 – Time EMS arrived at hospital
HELP!!!

• Michael Havenstein called and asked if he could have access to the KEMSIS database or if we could assist him locating EMS times of fatal crashes

• HIPAA

• Considered several options

• Nebraska and New Mexico have taken a similar path
Solution

• Added law enforcement permission group
• I wrote a report based that included the three fields that he needed and added eight additional fields to assist in identifying the correct patient
• KDOT already has the patients’ names
• NO $$$ except for 12 hours of my time and 2 of Michael’s
State Level Linkage: A How To Guide

Rogelio Martinez, M.P.H.
Data and Quality Assurance
Bureau of EMS and Trauma System
Arizona Department of Health Services
Identify Stakeholders
Arizona Governor's Office of Highway Safety (GOHS)

The focal point for highway safety issues in Arizona. GOHS a cabinet agency, provides leadership by developing, promoting, and coordinating programs; influencing public and private policy; and increasing public awareness of highway safety.

Director: Alberto Gutier
Promotes and protects the health of Arizona's children and adults. Its mission is to set the standard for personal and community health through direct care, science, public policy, and leadership.
Arizona Department of Transportation (ADOT)

Mission: To provide a safe, efficient, cost-effective transportation system.

Director: John S. Halikowski
Samples

- BEMSTS and ADOT will establish a secure process to integrate AZ-PIERS (pre-hospital), ASTR (trauma), and crash data.
- EMS agencies participation will increase by 30% from Q1 to the end of Q4.
- AZ-PIERS will establish a process for FARS analyst to improve their reporting to NHTSA.
Continuation of efforts

• Data integration
• Pilot studies by Interns- non identifiable information
• Erin Campbell – Probabilistic linkage and analysis of Arizona’s crash data and trauma registry
• Tom Finkelstein-
Linking data

- Deterministic
  - Name
  - Date of Birth
  - Social Security Number
  - Gender

- Potentials for future
  - License Number for injured
  - VIN, crash record number, date of injury
Assessment of Injury Severity

- KABCO versus Abbreviated Injury Scale
  - Based upon full medical evaluation
  - Available at all Level I & II trauma centers
  - Can calculate from ICD-9-CM codes
    - ICDMap and …
  - Translate to functional capacity at 1 year
    - Functional Capacity Index
      - Sickness Impact Profile & SF-36
      - Self-reported change in health status
      - Return to work
Where are we going?
HIE and NEMSIS
Beyond Health Level 7

• Harmonization with other Standards
  – Justice Datasets
  – EDXL
  – NIEM
  – DEEDS V3

• Facilitate Standards
  – CAD
  – Medical Devices
  – AACN (VEDS)

• Introduce Modules
  – Air Medical
  – Critical Care
  – Paramedicine
Facebook Account

NEMSIS (National EMS Information System)

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Health/Medical/Pharmaceuticals

The NEMSIS Project is an effort to create a National EMS Database. The database will contain data from local and state agencies from across the nation. www.nemsis.org

About – Suggest an Edit
www.nemsis.org
Questions