Promoting Innovation in EMS

Goals

• Relate the NHTSA Promoting Innovations in EMS (PIE) project to my world view

City of San Diego EMS

• 1.3 million population
• 8th largest U.S. city
• 160,000 EMS responses
• Since 1980
  • 6 City ALS provider agencies
  • 7 Mayors
  • 6 Fire Chiefs
  • 5 County EMS Medical Directors
  • 1 City EMS Medical Director

UCSD Department of Emergency Medicine

Promoting Innovation in EMS (PIE)

• Principal Investigators
  • Kevin G. Munjal MD, MPH
    • Asst. Professor of Emergency Medicine
    • Associate Medical Director of Prehospital Care, Mount Sinai Health System
  • James Dunford, MD
    • Professor Emeritus (Emergency Medicine), UC San Diego School of Medicine;
    • EMS Medical Director, City of San Diego

• http://emsinnovations.org
Objectives

- Engage a national dialogue re: challenges to local EMS innovation
- Create a national framework document to overcome barriers
- Clear a path for innovation
- Enable sustainable innovation

National Steering Committee

- American Ambulance Association
- American College of Emergency Physicians
- Emergency Nurses Association
- International Assoc. of Fire Chiefs
- International Assoc. of Firefighters
- Natl. Assoc. County & City Health Officials
- Natl. Assoc. of EMS Physicians
- Natl. Assoc. of EMTs
- Natl. Assoc. of State EMS Officials
- Natl. Volunteer Fire Council
- Visiting Nurse Assoc. of America

7 innovation themes

- Financial
  - Regional coordination
  - Legal reform
  - Medical direction
  - Stakeholder collaboration
  - Education
  - Data & telecommunications

- Legal
  - Create more flexible legislative and regulatory environments
  - Support more favorable reimbursement
  - Enable portability of licensure
  - Relax certificate of need policies

Financial

- Decouple payment from transportation
- Expand business & technical expertise
- Improve EMS grant opportunities
- Harness reimbursement via telemedicine
- Eliminate fraud & abuse

Educational

- Hold EMS professionals to higher educational standards
- Enhance education methods and technology
Regional coordination

• Regionalize care for time-critical conditions
• Share & utilize data more effectively
• Emphasize patient/provider safety

Interdisciplinary participation

• Enhance communication with key stakeholders
• Forge a common vision

Data & telecommunication

• Support the adoption of health information technology (HIT)
• Incentivize meaningful use of EMS data
• Champion the use of EMS data for population health
• Encourage social-health data exchange
• Improve public safety IT

City of San Diego EMS

• 1979 SDPD
  • EMT ambulances
• 1980 - 1984 Medevac Ambulance
  • 1st paramedic provider

City of San Diego EMS

• 1984 – 1992 Hartsons Ambulance
  • Paramedics threatened to strike
  • City required to augment subsidy
• 1992-1996 American Medical Services
  • Paramedics threatened strike
  • Provider sued city
  • City sued provider
  • Provider sued paramedics

March 1995

• “San Diego’s paramedic system is a ticking time bomb!”
  • Robert Ross, MD
    • County Director of Health Services
Blue Ribbon Panel RFP recommendations

- SPEED - when it matters
- ACCURATE RESOURCE ASSIGNMENT
- FLEXIBILITY
- NIMBLE FISCAL MANAGEMENT
- QUALITY/BENCHMARKING
- COMPASSION

1997 – San Diego Medical Services Enterprise, LLC

Cultural integration

San Diego Fire-Rescue

Rural/Metro Ambulance

Transport (acuity) codes

MPDS - Breathing Problem. Transport code profiles
SDMSE revenue sources

City of San Diego 911
CSA 17 911
Hospitals BLS, ALS, van
CCT

SDMSE revenue distribution

SD Fire-Rescue $555 Rural/Metro

Medical Director discretionary fund: $50K/year

San Diego RSI Trial


"Safe" intubation

"Unsafe" intubation

Advanced airway policy

Paramedics must verify ETCO2 before and after device placement.

Electronic medical record

TagCharts
- Developed by SDFD FF-Paramedics
  - John Pringle
  - Greg George
- Improved billing
- 300,000 patient database
- International awards
  - 2005 Mobile Enterprise Alliance
  - Best Mobile office solution
  - 2008 Computerworld
    - International/Healthcare finalist

SDMSE ruled illegal by City Attorney

City of San Diego
$10.6M
AMR
Rural/Metro

Deja vu

Preventable deaths: San Diego 1979

Preventable deaths: San Diego 1979

1984 – San Diego trauma system

The effect of trauma regionalization on care

Confidential oversight

Ambulance scene time - Gunshot/Stab Wounds
City of San Diego

1996: 10,000 Sobering Center intakes

Average duration of homeless - 15 years
Homeless Outreach Team (HOT) - problem-based policing

- San Diego Police Department
- Psychiatric Emergency Response Team (PERT)
- County eligibility worker

Serial Inebriate Program (SIP)

SIP partners
San Diego Police Department
San Diego EMS
Mental Health Systems, Inc.
San Diego Sheriff's Department
County Alcohol and Drug Services
San Diego City Attorney
Office of the Public Defender
Superior Courts
St. Vincent de Paul Village

1998
15 homeless inebriates
18 months
417 ED visits
$1,476,000

Dunford J. Report to SDPD Chief Lansdowne. unpublished
Goals

- Stop or slow the revolving door
- Provide treatment
- Increase quality of life

Serial Inebriate Program (SIP)

All Clients (529)

- Treatment offered 280 (53%)
- Not offered 249 (47%)

- Accepted 255 (55%)

SIP acceptance v. length of sentence

$73,552 less/month for clients who accepted SIP
The People v Thomas Kellogg (2004)
119 Cal. App. 4th 593, 14 Cal. Rptr. 3d, 507 (Petition for review denied, September 22, 2004)

• The state has a legitimate need to control public drunkenness when such behavior creates a safety hazard
• The state does not punish the mere condition of being a homeless, chronic alcoholic... rather the associated conduct that poses safety risk

San Diego Project Heartbeat

• SD Fire-Rescue Department
• Rural/Metro Ambulance
• SD Local 145
• AHA
• City Councilman Jim Madaffer
• Survivor
• Vendor

http://sdprojectheartbeat.com/

San Diego Project Heartbeat

• >8500 AEDs distributed
• Largest U.S. PAD program
• 153 lives saved

15M with syncope

• 15M collapsed on campus
• CPR; AED deployed
• Transported as possible seizure
Jim Dunford, MD
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“Syncope”

Anomalous origin of coronary artery, repaired

Legislative reform

High risk neighborhoods - low bystander CPR

Serra J, Sasson C, Dunford J. unpublished

PulsePoint
Jim Dunford, MD
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National Institutes of Health (NIH)
Resuscitation Outcomes Consortium (ROC)

High performance CPR

- Continuous compression
- Interposed ventilations
- 100% audio recording
- 100% crew feedback

Effect of ETT intubation on compression force

Effect of gurney move on compression

Regional STEMI care

Jack and Judy White Day
San Diego STEMI System  
January 16, 2007

- Alvarado Hospital
- Naval Medical Center San Diego
- Palomar Medical Center
- Scripps Hospital Encinitas
- Scripps Memorial La Jolla
- Scripps Mercy Hospital
- Scripps Mercy Chula Vista
- Sharp Chula Vista Medical Center
- Sharp Grossmont
- Sharp Memorial
- Tri-City Medical Center
- UCSD Medical Center
- UCSD Thornton

State STEMI care

San Diego Stroke System  
July 1, 2009

- Alvarado Hospital
- Kaiser Foundation Hospital
- Rady Children’s Medical Center
- Paradise Valley Hospital
- Poway Hospital
- Scripps Hospital Encinitas
- Scripps Memorial Hospital La Jolla
- Scripps Mercy Hospital
- Scripps Mercy Hospital Chula Vista
- Sharp Chula Vista Medical Center
- Sharp Coronado Hospital
- Sharp Grossmont
- Sharp Memorial
- Tri-City Medical Center
- UCSD Medical Center
- UCSD Medical Center La Jolla

Thrombectomy for large vessel occlusion
EMT training

- Fire station training
  - Battalion Medical Officer
  - 5% extra pay
  - 2hr sessions; 6x per year
- Classroom testing
  - Mandated by State EMS
  - 4 hours per year

On-line adult education

Team-based simulation

Hyper-realism

2017: SDFD paramedic academy

U.S. News and World Report – Job Scorecard

- #24 of 25 Best Healthcare Support Job
- #98 of 100 Best Jobs
- Median Salary
  - PM: $31,980
  - OT: $80,150
  - RN: $67,490
Beacon Community: San Diego Health Connect (HIE)

- Device/Envirn Cloud Services
- Clinical Cloud Services
- EMS Cloud Services
- Public Health Cloud Services

Health Information Exchange

- Hospitals
- Public Health
- EMS Hub
- Fire & EMS
- Health Systems
- Medical Groups

1163 frequent callers FY2013
> 6 ambulance calls/year

- 483 (35%) Psychiatric Issue
- 431 (35%) Geriatric
- 383 (35%) Homeless
- 4% Serial Inebriate

$15,394,082.08

San Diego Union-Tribune April 2012

Resource Access Program (RAP)

Anne Jensen, PM
RAP Coordinator

SDPD
HOT
HHSA
PERT
RESOURCES ACCESS PROGRAM (RAP)
Paramedicine Pilot Project

CALIFORNIA EMERGENCY MEDICAL SERVICES AUTHORITY
Financial tracking

<table>
<thead>
<tr>
<th>Unit Type</th>
<th>Case</th>
<th>Time Saved (Hours)</th>
<th>Total</th>
<th>Average</th>
<th>Estimated Cost</th>
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<tbody>
<tr>
<td>Ambulance</td>
<td>57</td>
<td>24,622</td>
<td>414.1</td>
<td>$2,425.73</td>
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<tr>
<td>Triage</td>
<td>6</td>
<td>184.12</td>
<td>30.69</td>
<td>$3,794.97</td>
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<tr>
<td>Tandem</td>
<td>30</td>
<td>75.93</td>
<td>2.53</td>
<td>$359.17</td>
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Effect of RAP on EMS resources: 51 clients

Effect of RAP on healthcare charges

Pre-RAP: $689,746
Post-RAP: $486,394

\[ \Delta = -$221,354 \]

Tadros AS, Castillo EM, Chan TC, Patel E, Watts K, Jensen AM, Dunford JV. Effects of an emergency medical services-based resource access program (RAP) on frequent users of health services. Prehospital Emergency Care 2012 Oct;16(4):541-547.
Jim Dunford, MD
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The most impactful

Jail

Medi-Cal

Homeless

Mental health

Project 25

Project 25: public cost savings

Public costs 2010 (Homeless)

$4,229,429

Public costs (P25 Year 2)

$1,574,839

Reverse 9-1-1: 211 EMS referrals

Community Information Exchange (CIE) San Diego:
Incorporating the social determinants of health
CIE is embedded in EHR and case management systems

User experience:
- User selects a client WITHIN their native case management or HMIS system
- Presses CIE icon
- Views client record in CIE

Technology:
- Real-time API integration
- Single sign-on
- Auto-quick search
- Validate view rights by user role

Risk Factors Associated with EMS use by at-risk Senior Center Clients

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Unadjusted OR (95% CI)</th>
<th>Adjusted OR (95% CI)</th>
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<tbody>
<tr>
<td>Previously hospitalization</td>
<td>1.304** (1.052, 1.603)</td>
<td>1.212**</td>
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<tr>
<td>Working with other social service programs</td>
<td>2.13** (1.099, 3.763)</td>
<td>2.003**</td>
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<tr>
<td>Use of self-reported severity</td>
<td>8.78 (5.26, 1.49)</td>
<td>8.67</td>
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<tr>
<td>Self-reported insulin</td>
<td>0.758 (0.171, 0.347)</td>
<td>0.994</td>
</tr>
<tr>
<td>Use of nutritional risk factors</td>
<td>1.503** (1.192, 1.884)</td>
<td>1.503**</td>
</tr>
<tr>
<td>Self-reported high-risk medical conditions</td>
<td>1.424* (1.027, 2.003)</td>
<td>1.424*</td>
</tr>
<tr>
<td>Self-reported psychiatric or substance abuse</td>
<td>1.525 (0.912, 2.574)</td>
<td>1.525</td>
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Regional vision: integrated IT

Regional alerting

CDC Vision for Public Health Surveillance in the 21st Century

2016 EMS grants - CA EMS Authority

- EMS
  - January 2016
  - 1st EMS grant from Office of the National Coordinator for Health Information Technology (ONC)
  - Demonstrate SAFR functionality
- ePOLST Registry
  - June 2016
  - S3G awarded Alameda County, San Diego Health Connect and vendor Vynca to develop a cloud-based POLST registry
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+EMS Grant SAFR Functionality: SEARCH

+EMS Grant SAFR Functionality: ALERT

+EMS Grant SAFR Functionality: FILE

+EMS Grant SAFR Functionality: RECONCILE

CA EMSA Core Quality Measures Project

- Trauma
- Acute coronary syndrome/AMI
- Cardiac Arrest
- Stroke
- Respiratory
- Pain intervention
- Pediatric
- Skill performance by EMS providers

AB 503 (September 2015)

- Authorizes health facilities to release patient-identifiable medical information to a defined EMS provider, a local EMS agency, and the authority "... to the extent specific data elements are requested for quality assessment and improvement purposes".
AB 1129 (January 2016)

- Requires that local EMSA use the most current version of NEMSIS and that they submit data to the CA EMS Information System

Whole Person Care Program

- California’s Section 1115 Medicaid waiver
  - Medi-Cal 2020
- $3 billion pilot program
- Support
  - CA State Association of Counties
  - County Behavioral Health Directors Assn.
  - County Health Executives Assn. of CA
  - County Welfare Directors Assn.
  - Local Health Plans of CA
  - SEIU California
  - Corp. for Supportive Housing

Use of EMS data to identify/address Spice outbreak

Next: remote expert medical control